Funding Proposal

FP217: Building Resilience of Vulnerable Communities to Climate Variability in Rwanda's Congo Nile Divide through Forest and Landscape Restoration

Rwanda | Government of Rwanda, acting through the Ministry of Environment | Decision B.37/12

24 November 2023

GREEN CLIMATE FUND

A

Contents

(a) PROJECT/PROGRAMME SUMMARY

A.1. Project or programme	Project	**A.2. Public or private sector**	Public	
A.3. Request for Proposals (RFP)	Not applicable			
A.4. Result area(s)			**GCF contribution**	**Co-financiers' contribution**
	Mitigation total		8 %	0 %
	☐ Energy generation and access		0 %	0 %
	☐ Low-emission transport		0 %	0 %
	☐ Buildings, cities, industries and appliances		0 %	0 %
	☒ Forestry and land use		8 %	0 %
	Adaptation total		92 %	100 %
	☒ Most vulnerable people and communities		13 %	49 %
	☒ Health and well-being, and food and water security		2 %	0 %
	☐ Infrastructure and built environment		0 %	0 %
	☒ Ecosystems and ecosystem services		77 %	51 %
A.5. Expected mitigation outcome	1,084,291tCO2eq	**A.6. Expected adaptation outcome**	Direct Beneficiaries: 1,254,242 (654,404 females)	Indirect Beneficiaries: 9,260,745 (4,769,284 females)
			30.9 % of the CND population	69.9% of Rwanda's population
A.7. Total financing (GCF + co-finance)	50,000,000 USD	**A.9. Project size**	Small (Up to USD 50 million)	
A.8. Total GCF funding requested	39,056,421 USD			
A.10. Financial instrument(s) requested for the GCF funding	☒ Grant 39,056,421 USD ☐ Loan - ☐ Guarantee -		☐ Equity - ☐ Results-based payment -	
A.11. Implementation period	5 years	**A.12. Total lifespan**	20 years	
A.13. Expected date of AE internal approval	TBD	**A.14. ESS category**	B	
A.15. Has this FP been submitted as a CN before?	Yes ☒ No ☐	**A.16. Has Readiness or PPF support been used to prepare this FP?**	Yes ☒ No ☐M	
A.17. Is this FP included in the entity work programme?	Yes ☒ No ☐	**A.18. Is this FP included in the country programme?**	Yes ☒ No ☐	
A.19. Complementarity and coherence	Yes ☒ No ☐			

A.20. Executing Entity information	**Rwanda Forestry Agency (RFA)** Country of Registration: Rwanda Ownership Type: Government agency.

A.21. Executive summary

Rwanda's Congo-Nile Divide (CND), an area of 444,600 hectares, is a high-elevation landscape of remnant natural forest reserves embedded in a mosaic of intensively managed smallholder farms and commercial plantations. Extending along a north-south ridge with an altitudinal gradient from 1,900m to 4,507m, the CND separates the drainage basins of the Congo and Nile Rivers. It is part of the Albertine Rift, which is one of the most biologically rich regions in Africa and "one of the most important regions for conservation" on the continent[1], containing more than half of Africa's birds and 40% of its mammals. At its highest elevations, the region is crowned by the Volcanoes, Gishwati-Mukura, and Nyungwe National Parks, containing Rwanda's only remaining montane forests, one of the most biodiverse ecosystems on the African continent, with high levels of endemism (species found nowhere else on Earth) and dozens of threatened species, including populations of mountain gorillas and chimpanzees. Nyungwe has been recognized as one of the six highest priority protected areas in the Albertine Rift due to its high endemism and globally threatened species (Plumptre et al 2016). Though covering barely 5% of the country, this archipelago of protected forests is of critical importance for:

- Its globally recognized high biodiversity values[2,3, 4, 5];
- Its role in Rwanda's acclaimed ecotourism offerings serving as the primary source of Rwanda's foreign revenue and as a major economic development driver[6, 7];
- The ecosystem services provided for surrounding subsistence farmlands, as well as for commercial tea and coffee plantations offering employment opportunities for women while providing the 2nd and 3rd highest sources of foreign revenue[8,9];
- The regulation of water capture and release to growing urban centers on the CND periphery[10], the nation's extensive river network, and downstream hydroelectric operations[11]; and
- The sequestration and storage of nearly 60% of Rwanda's national carbon stocks[12].

These values and services are already compromised by a combination of anthropogenic and climatic factors; they will be much more severely threatened by the potential negative feedback loops associated with projected climate change impacts. The Project will promote an ecosystem-based approach to forest protection and restoration and will enhance the extent and resilience of forest ecosystems and species, including functionally linking currently isolated forest fragments. Through these approaches, the Project will protect, restore and rehabilitate forest ecosystems, enhancing biodiversity and reducing key threats, while

1 Plumptre, A.J., et al. 2007. The biodiversity of the Albertine Rift. Biological Conservation 134:178-194.

2 Plumptre, et al. 2016. Conservation Action Plan for the Albertine Rift. Wildlife Conservation Society

3 UN/CBD. 2020. Rwanda 6th National Report to the Convention on Biological Diversity

4 2012. .Eastern Afromontane Biodiversity Hotspot. Critical Ecosystems Partnership Fund.

5 2023. Nyungwe National Park. BirdLife International. www.birdlife.org.

6 RDB. 2021. Rwanda Development Board Annual Report

7 2010. *In the Kingdom of Gorillas*. Weber & Vedder.

8 Andrew, G., Masozera, M. 2010. *Payment for Ecosystem Services and Poverty Reduction in Rwanda*. Journal of Sustainable Development in Africa (V12, No.3)

9 RDB. 2021. Annual Report.

10 Karamage, F., et al., 2017. *Modeling Rainfall-Runoff Response to Land Use and Land Cover Change in Rwanda (1990–2016)*. Water 2017, 9(2), 14.

11 Rwanda Environment Management Authority (REMA), 2009. Rwanda State of Environment and Outlook Report, Chapter 8: Energy Resources.

12 Mugabowindekwe, M., Brandt, M., Chave, J. et al. Nation-wide mapping of tree-level aboveground carbon stocks in Rwanda. Nat. Clim. Chang. 13, 91–97 (2023). https://doi.org/10.1038/s41558-022-01544-w

increasing the provision of critical ecosystem services to strengthen adaptation of vulnerable communities.[13] [14]

The CND landscape supports nearly one-third of Rwanda's population on barely one-fifth of its land base. Average population density is 736 people/km^2, with some districts now exceeding 1,000 people/km^2[15]. The highest rates of rural poverty in the country are reported from the CND, including its most vulnerable subsistence farmers. While high rainfall has historically permitted generally sufficient food production, the region's rugged topography requires farming on extremely steep slopes. With more frequent extreme rainfall events in recent years, this agricultural landscape is recognized as the region of Rwanda most vulnerable to floods and landslides[16]. Between 2013-2016 heavy rains generated landslides that killed at least 174 people and destroyed the homes of more than 5,000. Many of these landslides caused flooding of highly productive raised-bed cultivation systems in the CND's many valleys and surrounding bottomlands and many hectares of crops being washed away annually[17]. An estimated 1.5 million tons of fertile soil are lost annually to erosion[18].

CND forests are essential to the region's climate resilience. Since independence, the total natural forest cover has declined 40%, from 219,000 ha to 130,700 ha, mostly from episodic planned excisions as well as uncontrolled incursions. The loss around the Gishwati and Mukura core forest area has been most extreme. Of the original 32,098 ha in the 1980s, now only 3,460 ha remains as natural forest: almost a 90% loss (see Annex 2). In comparison, the Volcanoes and Nyungwe boundaries have been stable for decades. The recent creation of the Gishwati-Mukura National Park is an important step toward halting and partly restoring this forest, particularly for its land stabilization and other ecosystem services within the CND's most vulnerable lands and dependent communities.

IPCC models predict rising temperatures and increasingly intense precipitation events for the CND through the rest of this century. The rainfall implications are especially threatening for smallholders farming on steep, heavily deforested slopes, where they are most exposed to landslides, leading to loss of crops, homes, and lives. Yet their adaptive capacity is low because crop yields are vulnerable to rainfall variability and because high population density severely limits their options for relocation in the event of disaster. This is particularly true for women who, until very recently, had fewer legal land rights than men. The expected 2℃ increase in temperature would further result in a more than 470m rise in vegetation zone elevations, impacting traditional crop selection and management practices for future farmers. An increase of this scale would also dramatically alter the optimal ranges for tea and coffee production, introducing potential competition between these important export crops and alternative land uses.

This Project is designed to sustain and expand critical forest ecosystem functions in the CND, and ultimately enhance the resilience of the vulnerable communities who depend on them. This will be done by strengthening government capacity for spatial planning, resulting in institutional and regulatory policies to promote and integrate climate adaptation strategies, based on the latest science, through coordinated planning at the national and district levels. It will also protect, restore and expand natural forest in and around

13 2003. Interlinkages Between Biological Diversity and Climate Change. CBD Technical Series Number 10.

14 2022. Ecosystems and ecosystem services Sectoral Guide. Green Climate Fund.

15 National Institute of Statistics of Rwanda (NISR); The Fifth Rwanda Population and Housing Census, Main Indicators Report, February 2023

16 https://www.gfdrr.org/sites/default/files/publication/National_Risk_Atlas_of_Rwanda_electronic_version_0.pdf

17 Nsengiyumva JB, et al., 2018 Landslide Susceptibility Assessment Using Spatial Multi-Criteria Evaluation Model in Rwanda. International Journal of Environmental Research and Public Health. 15(2):243. https://doi.org/10.3390/ijerph15020243

18 Bizimana, H.; Sönmez, O. 2015 *Landslide Occurrences in the Hilly Areas of Rwanda, Their Causes and Protection Measures.* Disaster Sci. Eng. 2015, 1, 1–7

the core national parks; consolidate and expand some smaller but critical "stepping stones"[19] of remaining natural habitat between these national parks (mainly small forest patches and wetlands/ riparian areas); improve the landscape linkage function of key high altitude landscape linkages between the protected areas, while at the same time securing ecosystem services through afforestation and improved native species mix for plantation forests on steep slopes; silvopastoral interventions on cultivated pasture; and agroforestry interventions in regenerative agricultural areas. Complementary activities will address key drivers of deforestation while creating alternative livelihood pathways for youth and women through ecotourism and income-generating, climate-resilient crops, as well as strengthening supportive financial services.

Project interventions will include 10,000 ha of land (including both forest and silvopastoral sites) under improved, climate-resilient management; and improve agroforestry practices on 3,346 ha of on-farm plantations, directly benefiting 1,254,242 people (654,404 women) in CND with more climate resilient livelihoods from reduced exposure to landslides, floods and soil erosion and more knowledge on climate risks, value of forests and forests ecosystems, climate adaptation options, access to indigenous and agroforestry quality materials and improved ecosystem services. The project will also indirectly benefit 9,260,745 people nationally mainly from the education and outreach program on climate change and gender issues, climate risks, value of forests and forest ecosystems, climate adaptation options, and will create approximately 24,212 job opportunities in CND forest-dependent communities. The total mitigation impact from reduced deforestation, forest restoration introduction and adoption of improved cookstoves is estimated to be 1,084,291t CO_2-eq by 2043.

(b) PROJECT/PROGRAMME INFORMATION

B.1 (a). Climate context

This section draws from the Climate Change Vulnerability Assessment presented in Annex 2.1, where more comprehensive elaboration can be found. Discussion on climate predictions is based primarily upon multi-model means from the Coupled Model Intercomparison Project's sixth phase (CMIP6)[20], used in the Sixth IPCC Assessment Report. Results are shown for paired Shared Socioeconomic Pathways (SSP) and Representative Concentration Pathway (RCP) emission scenarios; for some variables emphasis is placed on a "pessimistic" high SSP-high RCP scenario (SSP5-8.5), for greater distinction between present day and future conditions as a consequence of anthropogenic climate change. Specialized modeling performed at ultra-high resolution for the East African Great Lake Environments project (EAGLE)[21], and findings from scientific literature are utilized as well. Key findings are outlined in Table 1, and each climate component theme is discussed in the section on projected climate change impacts below.

19 Bagchi, R., et al. 2018. Forecasting potential routes for movement of endemic birds among important sites for biodiversity in the Albertine Rift under projected climate change. Ecography. 41: 401-413.

20 Coupled Model Intercomparison Project Phase 6. Link

21 Grim, J. A., Pinto, J. A., Jensen, A. A., & Seimon, A., 2020: The East African Great Lake Environments (EAGLE) Climate Downscaling Dataset. Link

Table 1. ***Principal Climate Hazards of the Congo Nile Divide through Mid-century***

Climate component	Character of change	Level of confidence	Near-term concern	Mid-century concern	Project Response
Temperature	Upward trend from global greenhouse gas emissions and land-use change	Very high for +2.6 °C net increase 1970-2040	Elevational range of biota including pests and pathogens increasingly out of balance	Major uphill displacements of biota including cultivars due to ~470 m rise in thermal conditions	**Promotion of agroforestry practices**: contribute to the conservation of soil moisture and its recharge through the infiltration of rainfall and runoff water, the creation of sheltered microclimatic conditions, and the inclusion into the soil of organic matter that contributes to moisture retention. **Promotion of silvopastoral practices**: Improve soil properties due to greater uptake of nutrients from deeper soil layers, enhanced availability of nutrients from leaf-litter and increased nitrogen input by N2-fixing trees.85 Moreover, silvopastoral systems enhance the resilience of the soil to degradation, nutrient loss, and climate change, while enhancing water holding and infiltration capacity of the soil which contributes to the regulation of the hydrological cycle by reducing runoff intensity[22],[23]. **Protective restoration measures at erosion-prone areas**: Reduce exposure to soil erosion and floods of communities and their assets living in the road and river side. **Restoration** of degraded natural forests in protected areas **Improve protected areas management** to reduce potential human threats (forest encroachment , mining, fire). **The project will support activities aimed at** (1)promote alternative livelihoods that are resilient to climate change (2) decrease of demand and (3) increase of wood supply capacity. Dissemination of Improved Cook Stoves The project will support the development of an **integrated**
Annual precipitation	Increasing totals	Moderate, but considerable model variation	Low concern, with natural interannual variability still dominant	Moderate concern, with majority of models showing upward trend	
Precipitation intensity	Increasing short-period rainfall and storm totals	Almost certain to occur	Severe landslide hazard already present and increasing, building flash flood potential	Extreme hazard: widespread and frequent landslides and flash floods	
Cloud base height	Rising cloud base and levels of fog immersion in forests	Likely ongoing, will continue with temperature increase	Already significant in deforested highlands with some loss of moisture provision	Of major concern to forest ecology in protected landscapes	
Drought/dry spells	Increasing intensity	Moderate	Some increase in vegetation desiccation potential, possibly enhancing fire risk	Sustained risk of increase in desiccation and fire risk, possibly offset by rainfall increases	
Wildfire	Increasing occurrence and extent in forested areas	Low	Relatively random occurrences, as in the recent past, that could be managed by improved vigilance	If rainfall increases do not occur, increased vegetation desiccation would intensify risk for widespread fire	
Climatic seasonality	Disappearance of mid-year dry season	Low, but explicitly shown in some models	No concern	Increasing convective storm occurrences in June-Aug may eliminate dry season	

(b) PROJECT/PROGRAMME INFORMATION

					land use plan at landscape level that identifies and integrates the trade-offs necessary to improve delivery of ecosystem services, conserve natural resources and sustain economic growth.

- **Climate baseline and current impacts**

The climate of western Rwanda and its CND landscape features conditions highly supportive of tropical montane forests, rich biodiversity and human activities alike. Despite being located deep in the tropics just south of the equator, the elevated terrain of the CND landscape, mostly above 2,000 meters, ensures relatively cool temperatures through the year (**Figure 1**).

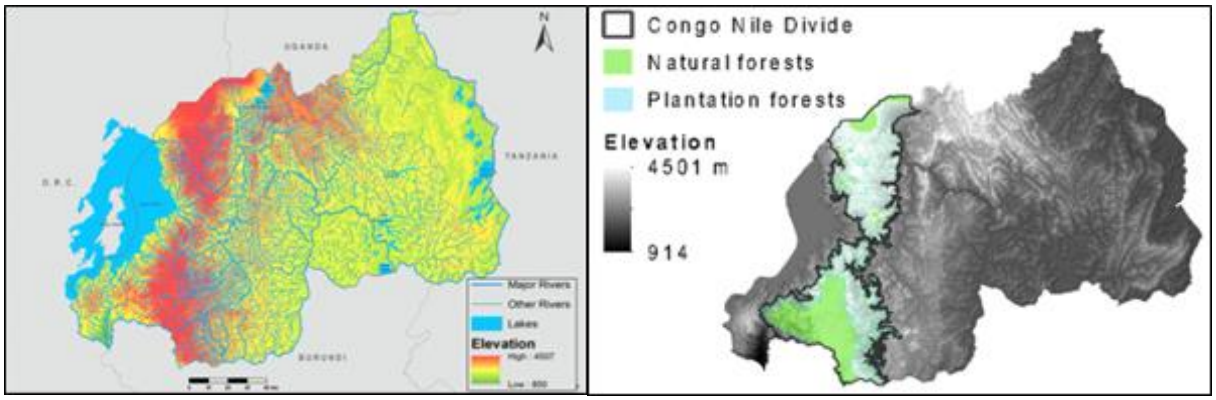

Figure 1 ***(left)*** *Topographic map of Rwanda with riverine drainage channels overlaid. Source: Rwanda (2019)[24]; (**right**) Congo Nile Divide, identified by the 1,900 m elevation contour and showing the presence of natural and plantation forests.*

Rainfall is abundant for nine out of 12 months, and a reliable mid-year dry season adds dynamic character to phenological cycles, pollinator activity and agricultural practices (**Figure 2**). Prior to landscape conversion for agricultural purposes, continuous dense forest cover yielded augmentation of precipitation through fog interception in tree canopies, and near-daily cloud immersion sustained cloud forest ecosystems and species assemblages. The forests also maintained slope stability in steep terrain and yielded percolation and groundwater recharge rather than direct runoff of heavy precipitation. Such conditions are now constrained to within the CND's protected forests within national parks, covering just 30% of the CND landscape and just 5% or Rwanda's total land surface. These are Rwanda's only remaining montane forests yet represent

22 Ibrahim M, Guerra L, Casasola F, Neely N, 2010. Importance of silvopastoral systems for mitigation of climate change and harnessing of environmental benefits. In: Abberton M, Conant R, Batello C (Eds) Grassland carbon sequestration: management, policy and economics. Proceedings of the workshop on the role of grassland carbon sequestration in the mitigation of climate change. Integrated Crop Management, Vol. 11. FAO, Rome, Italy. http://www.fao.org/docrep/013/i1880e/i1880e09.pdf .

23 Jose S., 2009. Agroforestry for ecosystem services and environmental benefits: an overview. Agroforest Syst 76 (1):1–10.

24 Vital Signs, 2019: Rwanda Atlas. Environment, Agriculture and Livelihood Options. Vital Signs and WCS Rwanda. Link.

(b) PROJECT/PROGRAMME INFORMATION

58.7% of national tree carbon stocks[25] and are imperiled by intense population pressures, with 30.7% of the country's population residing within the CND landscape districts.

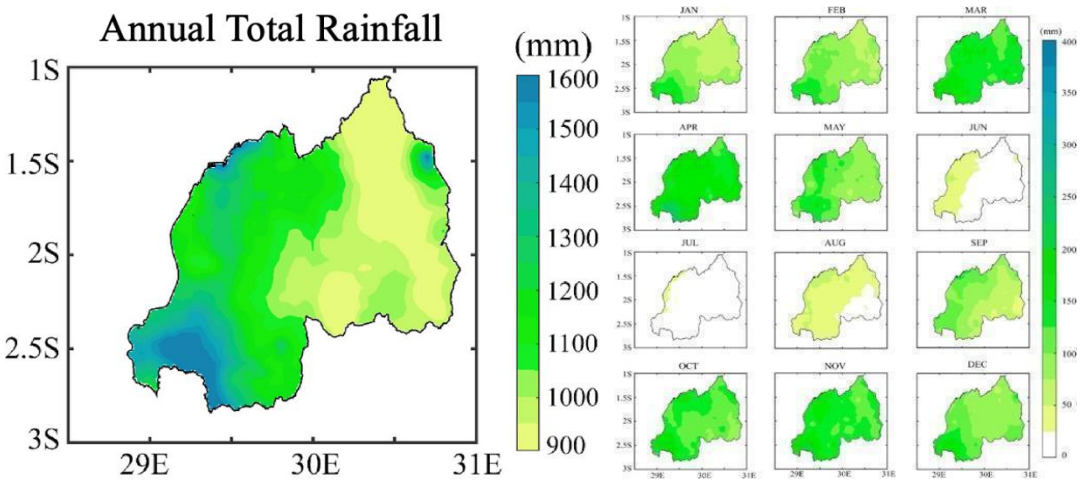

Figure 2. Annual (**left**) and monthly (**right**) rainfall (mm) climatology over Rwanda (period of record: 1981–2017), based on algorithms that calibrate satellite-based rainfall estimates with surface observations. Source: Jonah et al., 2021.[26]

A reconstruction of temperatures for the past 140 years for Rwanda, based on quality controlled instrumental records and centered on Kigali, shows that global climate change already has strong local expression. Rapid temperature increase commenced in the 1970s, with a net gain of approximately +1.1 °C since 1970[27] (**Figure 3**).

25 Mugabowindekwe, M., Brandt, M., Chave, J. et al. Nation-wide mapping of tree-level aboveground carbon stocks in Rwanda. Nat. Clim. Chang. 13, 91–97 (2023). https://doi.org/10.1038/s41558-022-01544-w

26 Jonah, K., Wen, W., Shahid, S., Ali, M.A., Bilal, M., Habtemicheal, B.A., Iyakaremye, V., Qiu, Z., Almazroui, M., Wang, Y. and Joseph, S.N., 2021. Spatiotemporal variability of rainfall trends and influencing factors in Rwanda. *Journal of Atmospheric and Solar-Terrestrial Physics*, *219*, p.105631.

27 Berkeley Earth (website): Rwanda Country Profile. www.berkeleyearth.org

(b) PROJECT/PROGRAMME INFORMATION

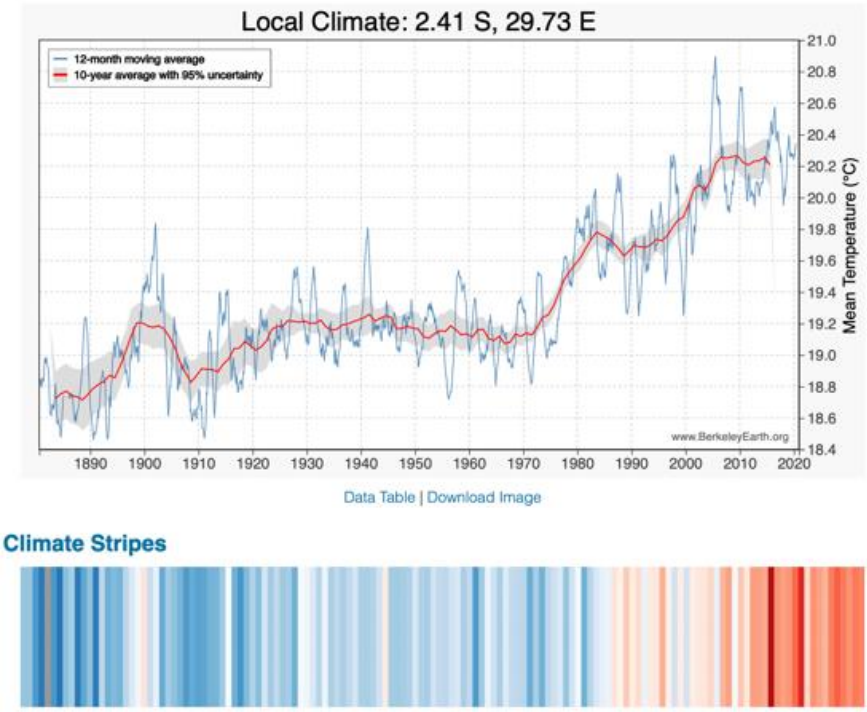

Figure 3. Berkeley Earth temperature reconstruction based on instrumental measurements for Kigali in central Rwanda. The "Climate Stripes" offers a visual display that effectively communicates both individual year temperature anomalies and the overall multi-decadal trend behavior. Source: Berkeley Earth Rwanda Country Profile. www.berkeleyearth.org

The regional warming of the climate over the past half-century coincided with widespread forest conversion to farmland along the CND. As a consequence, at fine spatial scales climatic conditions across the CND at present mimic the landscape mosaic, whereby only the protected forests will retain much of the past climatic character while converted landscapes are likely to be significantly warmer by day, have reduced cloud cover and higher cloud bases, and experience slightly reduced rainfall as well. Due to the increased moisture carrying capacity of warmer air (7% increase per °C of warming)[28], ongoing climatic warming promotes increasingly intense short-period rainfall, which acts synergistically with landscape conversion on steep slopes to cause quickflow runoff, yielding large increases in landslide occurrence and soil erosion more generally (**Figure 4**). With its high topographic relief, the CND is highly susceptible to soil erosion. **Throughout Rwanda, soil erosion has increased by 54% since 1990 with the bulk of the increase experienced and highest erosion levels over western Rwanda.[29]** Between January and June in 2018, landslides caused more than 200 mortalities, and in May 2020[30], 65 deaths from landslides and flash flooding occurred during a single night of storms focused on the eastern slopes of the CND.[31]

28 Trenberth, K.E., 2011. Changes in precipitation with climate change. *Climate Research*, 47, pp.123-138.

29 National Institute of Statistics of Rwanda, 2019: Rwanda Natural Capital Accounts-Ecosystems. p. 23

30 Reuters 2018. https://www.reuters.com/article/us-rwanda-floods-idUSKBN1I81I

31 Associated Press 2020. https://apnews.com/article/b7658b76a403fd9bc8cba249f9d484fd

(b) PROJECT/PROGRAMME INFORMATION

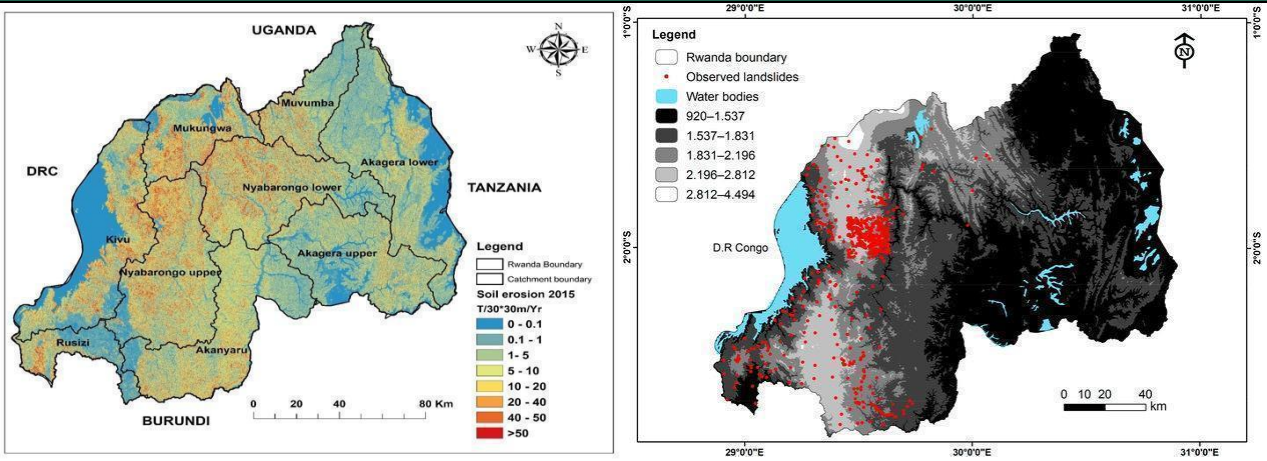

Figure 4. (**left**) Intensity of soil erosion in Rwanda assessed for the year 2015. Source: NISR: National Institute of Statistics of Rwanda, 2019. (**right**) Observed landslide occurrences in Rwanda against a topographic background, showing intense clusters along both the east and west sides of the CND landscape. Source: Nsengiyumva et al., 2018.[32]

Wildfire occurrence in forested lands exacerbated by climatic warming is a rapidly mounting concern globally, and montane forests of the CND carry increasing vulnerability to loss from burning. Absence of fire-adapted flora in CND highland forests, however, suggests that fire has not been a major selective force within the forest ecosystem. The 1997 visitation of weeks-long uncontrolled wildfires in the Nyungwe forest had an ecological imprint that remains evident 25 years later, as burned areas revegetated with dense ferns rather than replacement forests,[33] representing a net loss of 12% of Nyungwe's forest cover and corresponding loss of its carbon endowment. Despite increased propensity for drying of vegetation as the climate warms, forests remain sufficiently moist such that fire causing forest losses are infrequent, and when they occur are usually tied to anomalous dry spells paired with human ignition, as was the case in 1997.[34]

Cloud base altitude, which is highly influential in CND montane forest ecology and species composition, is likely rising above recent past conditions due to both climatic warming and conversion of forests to agricultural lands. Fog interception by vegetation augments montane forest precipitation in central African highland forests by an estimated 10%[35], so highland forest loss by human action therefore represents a local reduction to the ecosystem service of rainwater provision).

Projected climate change impacts

Temperature increases. Localized projections for the CND landscape of climatic changes for coming decades, generated for the most recent IPCC assessment, present a strong consensus on temperature increase for the next two decades. The magnitude of net temperature change by late-century, and the tendency of warming to accelerate, hold steady, decelerate or even begin an overall temperature decline is unknowable at present, but a large number of climate model simulations show common patterns, whereby divergence in possible temperature outcomes will only become apparent around 2040 (**Figure 5**). These

32 Nsengiyumva, J.B., Luo, G., Nahayo, L., Huang, X. and Cai, P., 2018. Landslide susceptibility assessment using spatial multi-criteria evaluation model in Rwanda. *International journal of environmental research and public health*, *15*(2), p.243.

33 Masozera, A.B. and Mulindahabi, F., 2012. Post-fire regeneration in Nyungwe National Park-Rwanda. WCS White paper report.

34 Seimon, A., 2012: Climatology and Potential Climate Change Impacts of the Nyungwe Forest National Park, Rwanda. WCS White paper report, Wildlife Conservation Society, New York, USA, 44 pp.

35 Bruijnzeel, L.A., Mulligan, M. and Scatena, F.N., 2011. Hydrometeorology of tropical montane cloud forests: emerging patterns. *Hydrological Processes*, *25*(3), pp.465-498.

results are also consistent with outputs from the previous CMIP5 model suite for western Rwanda (e.g., IFAD report 2020)[36]. As such, using the consensus values of such models is a sensible choice for environmental planning, with a +2.0 °C increase over the IPCC-referenced 1995-2014 baseline conditions offering a representative value for warming by mid-century. However, the observed warming of +0.6 °C registered between 1970-95 prior to the IPCC baseline period must be recognized as well, suggesting **net warming of +2.6 °C from a more representative 20th century baseline.**

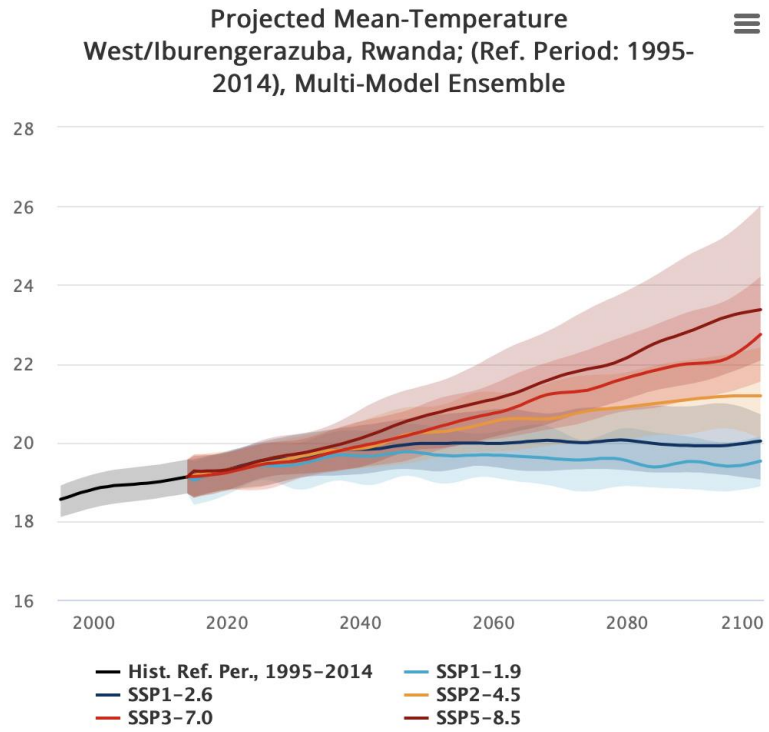

Figure 5. CMIP6 multi-model ensemble predictions for mean annual temperature over western Rwanda across the 21st century under a variety of SSP-RCP combinations. Source: World Bank[37]

Annual mean precipitation changes. The CMIP6 results for precipitation changes over coming decades are less consistent than the temperature projections. Recent studies focused in East Africa have identified limitations to global model utilization for regionally specific predictions, such as failure to represent observed precipitation magnitude and distribution in the present, and reliance on approximations (i.e., parameterizations) that inadequately represent the role of convective storms in precipitation delivery[38]. The CMIP6 ensemble means for annual precipitation over western Rwanda have a baseline value of approximately 2,000 mm per year, which is considerably higher than actual values (**Figure 6**; compare values with Figure 2 above). The higher emissions scenarios show increasing totals over time, which is plausible given the increasing water vapor carrying capacity of the warming atmosphere. Strangely, the most optimistic scenario (SSP1-1.9) shows strongly varying trends at decadal scales, increasing far more rapidly

36 Hunter. R., Crespo. O., Coldrey, K, Cronin, K, New, M. 2020. Research Highlights – Climate Change and Future Crop Suitability in Rwanda. International Fund for Agricultural Development (IFAD), Rome.

37 World Bank Climate Change Knowledge Portal. Link

38 Wainwright, C.M., Marsham, J.H., Rowell, D.P., Finney, D.L. and Black, E., 2021. Future changes in seasonality in East Africa from regional simulations with explicit and parameterized convection. *Journal of Climate*, *34*, pp.1367-1385.

in the near-term than other scenarios. Such inconsistencies reduce confidence in the overall product suite for precipitation predictions.

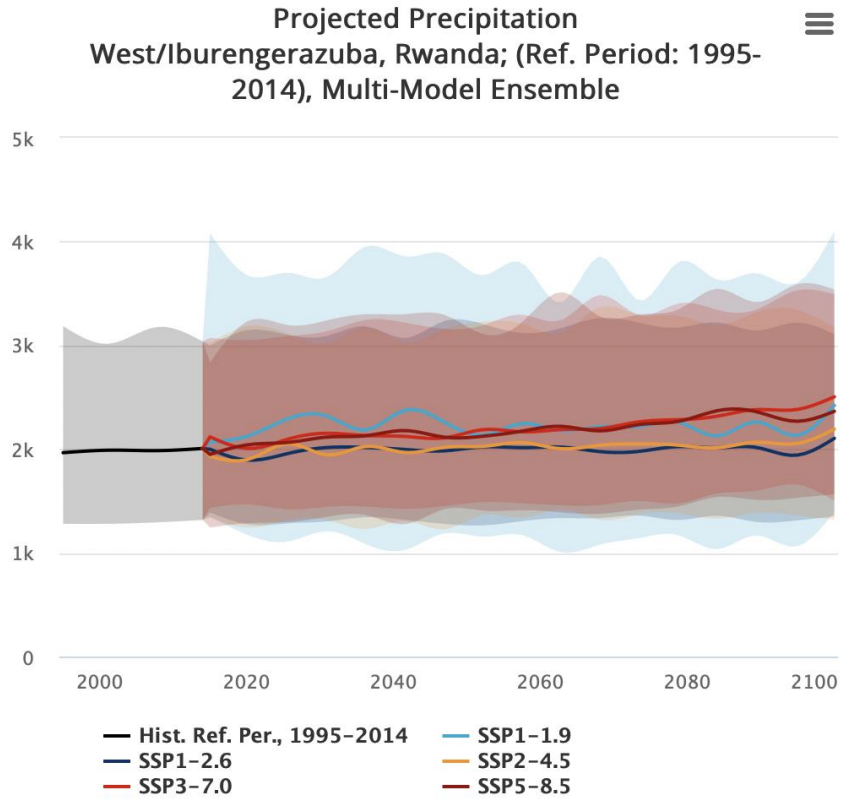

Figure 6. CMIP6 multi-model ensemble prediction for mean annual precipitation over western Rwanda across the 21st century under a variety of SSP-RCP combinations. Left-axis scale is thousands of mm per year. Source: World Bank[39]

There is also major inconsistency between CMIP model suites. As assessment for western Rwanda from CMIP5 under RCP 8.5 comparing historical and mid-century outputs suggested rainfall decreases of 5-10% in most months, with net annual decrease of 86 mm [40]; the baseline time periods and geographic domains of these two CMIP ensemble compilations for western Rwanda differ, but the reversal from drier to wetter gives low confidence in the utilization of precipitation predictions specific to the CND if derived from global models.

To generate more refined results, Grim et al., (2020)[41] performed regional simulations of East African climate at ultra-fine, convection-allowing scale (WRF model at 3.3 km model resolution); these were based off the global CESM2 model (part of the CMIP6 suite) boundary conditions under the high emissions RCP8.5. The regional model was configured to optimize parity with regional climate station data. The resulting high spatial resolution output suggests a strongly amplified rainfall signal over the 21st century over western Rwanda relative to the CMIP6 ensemble mean for RCP 8.5 (**Figure 7**). Also notable is that the rest of Rwanda exhibits

39 World Bank Climate Change Knowledge Portal. Link

40 Hunter. R., Crespo. O., Coldrey, K, Cronin, K, New, M. 2020. Research Highlights – Climate Change and Future Crop Suitability in Rwanda. International Fund for Agricultural Development (IFAD), Rome.

41 Grim, J. A., Pinto, J. A., Jensen, A. A., & Seimon, A. (2020). The East African Great Lake Environments (EAGLE) Climate Downscaling Dataset (NCAR Technical Note TN-563+STR). Link

far smaller increases, suggesting that the CND's hydrological significance as a water tower for the nation will be reinforced over time.

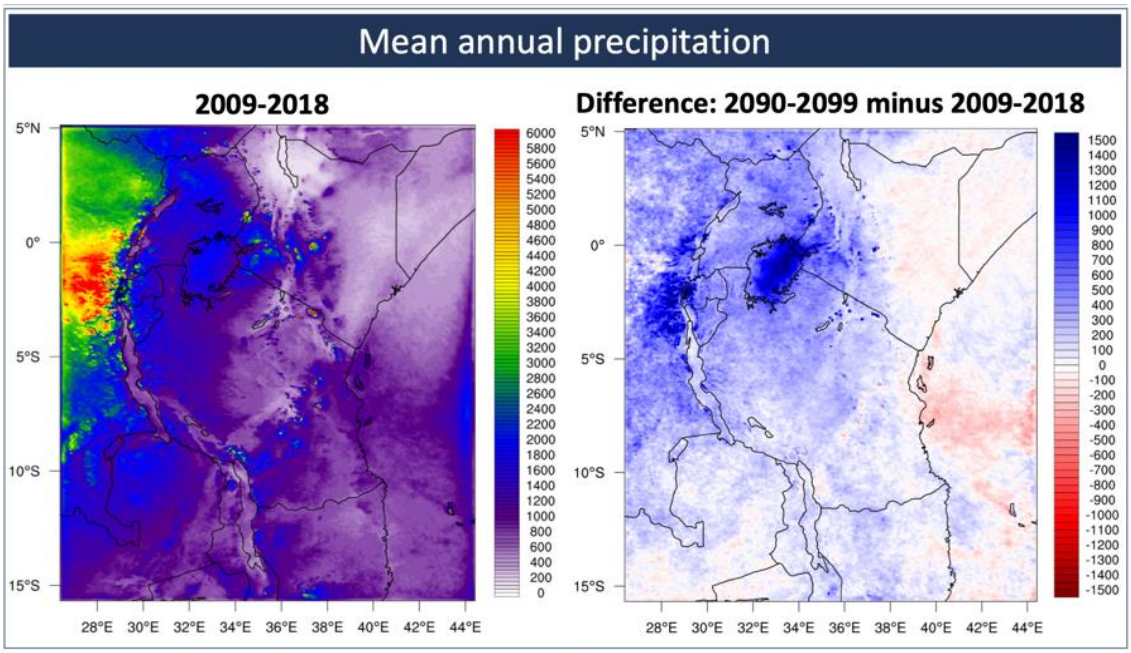

Figure 7. EAGLE projects high-resolution WRF simulation of annual mean precipitation (**left**) and difference between end of century and recent past (**right**) across East Africa, where values are in mm per year. The CND landscape and Lake Kivu show comparable increases to eastern Lake Victoria, and represent the largest rainfall increases across the modeled domain. Source: Grim et al. (2020)[42]

Precipitation intensity changes. Due to well-understood physical properties of the atmosphere, as warming progresses short-period rainfall rates and individual storm totals, especially for the fraction of higher-end events that can cause flash flooding and promote landslides, will increase and should amplify very significantly over time[43]. The CMIP6 ensemble means for monthly counts of days with heavy precipitation suggest an upward trend is now underway (**Figure 8**). Forthcoming increases are most pronounced for November through January. Such increases in heavy precipitation events are to be expected under a warming climate and are of major social and ecological concern, being a driver of landslide occurrences and major contributors to soil erosion intensity.

42 Grim, J. A., Pinto, J. A., Jensen, A. A., & Seimon, A. (2020). The East African Great Lake Environments (EAGLE) Climate Downscaling Dataset (NCAR Technical Note TN-563+STR). Link

43 Fowler, H.J., Ali, H., Allan, R.P., Ban, N., Barbero, R., Berg, P., Blenkinsop, S., Cabi, N.S., Chan, S., Dale, M. and Dunn, R.J., 2021. Towards advancing scientific knowledge of climate change impacts on short-duration rainfall extremes. *Philosophical Transactions of the Royal Society A*, 379(2195)

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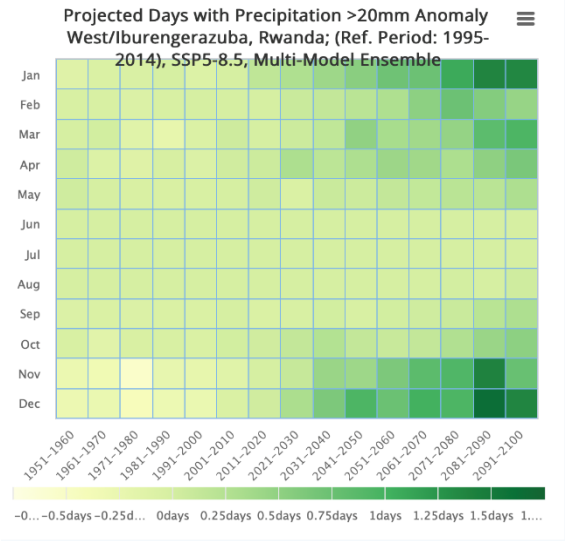

Figure 8. CMIP6 multi-model ensemble prediction for monthly changes in the number of days with rainfall >20 mm over western Rwanda across the 21st century under RCP8.5. Source: World Bank[44]

Drought/dry spells. Warming will also increase the propensity for vegetation to desiccate during dry spells, intensifying wilting of natural vegetation and cultivars. The capacity of air to extract moisture from landscapes through direct evaporation and evapotranspiration of vegetation will also increase exponentially as temperatures rise. This means that land surfaces and vegetation will dry out more quickly between rainfall episodes in the future than in the past. It also means that to maintain hydrological balances that natural and human systems depend upon, total rainfall must increase in proportion to intensifying evaporation rates. The CMIP6 ensemble results for the CND region suggest such a favorable balance may indeed be maintained through at least mid-century (**Figure 9**). Under the full range of emissions scenarios considered, there is almost no change in ensemble means through mid-century.

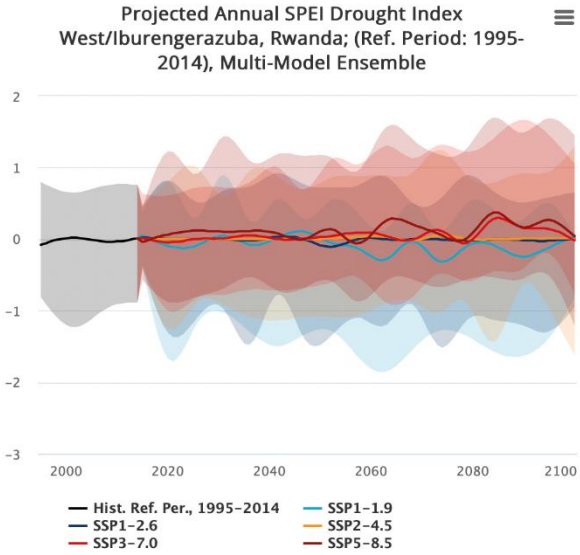

Figure 9. Western Rwanda CMIP6 model-model ensemble mean time series of the Standardized Precipitation Evapotranspiration index (SPEI) for a range of climate change scenarios across the 21st century. The SPEI is a measure of the integrated water deficit

44 World Bank Climate Change Knowledge Portal. Link

in a location, taking into account the contribution of temperature dependent evapotranspiration of a 12-month period. Source: World Bank[45]

A more useful variable for assessing drought potential at daily-seasonal times scales is the Vapor Pressure Deficit (VPD). This is an absolute measure of the difference between the water vapor content of the air and its saturation value, and as such, represents a direct metric of the ability of the atmosphere to extract moisture from the land surface[46]. High resolution VPD predictions for present day, mid-century and late-century under boundary conditions prescribed by the CESM model under the high emission RCP 8.5 scenario are shown in **Figure 10**. Annual cycles of VPD for model grid points high in the Nyungwe Forest and at lesser elevation in Kigali east of the CND both show remarkably little variation in VPD over the course of the century. Owing to the cool, persistently moist highland climate that characterize the CND landscape, the VPD values are consistently low in Nyungwe throughout the year for the three decadal time periods 2009-18, 2055-64 and 2090-99. This contrasts significantly with results from Kigali, where VPD registers four times higher than in Nyungwe during the mid-year dry season (20 vs. 5 hectopascal pressure deficit). This represents a favorable outlook over several decades to come for the CND in terms of limiting desiccating conditions that would elevate fire potential, stress crops and rapidly draw down hydrological resources. Importantly, however, not clearly evident in these model outputs is that rising cloud bases and associated warming temperatures increase the rate of drying of vegetation, increasing wildfire risk during rain-free periods, especially in lower reaches of forested terrain bordering settled areas where risks of anthropogenic ignition are highest.

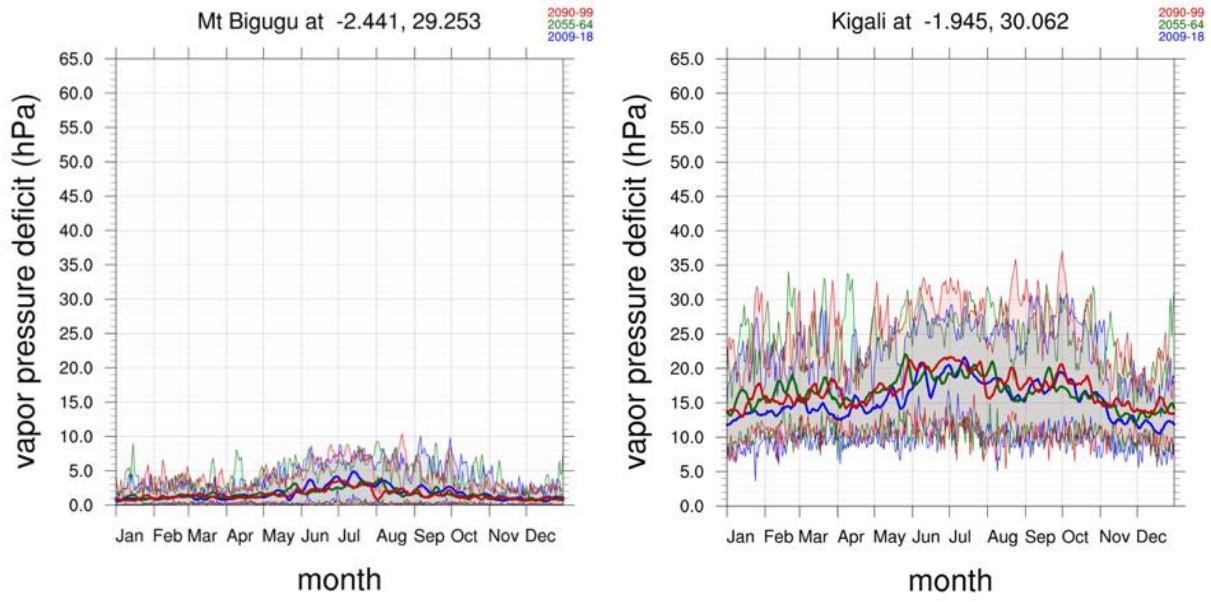

Figure 10. Modeled Vapor Pressure Deficit (VPD) on slope of Mt Bigugu in the Nyungwe Forest (**left**) and Kigali (**right**) for the recent past (2009-18, blue, mid-century (2055-64, green) and late-century (2090-99, red). Source: EAGLE project[47]

Precipitation seasonality. The annual cycle of climate along the CND sees abundant rainfall for much of the year interrupted by a marked dry season in the June-August months when rainfall becomes light and sporadic, and during which hydrological deficits develop as evaporation far exceeds precipitation and resultant runoff. While highland orography largely explains the enhanced rainfall along the CND, the

45 World Bank Climate Change Knowledge Portal. Link

46 Seager, R., Hooks, A., Williams, A.P., Cook, B., Nakamura, J. and Henderson, N., 2015. Climatology, variability, and trends in the US vapor pressure deficit, an important fire-related meteorological quantity. *Journal of Applied Meteorology and Climatology*, *54*(6), pp.1121-1141.

47 East African Great Lake Environments (EAGLE) project. Link

occurrence of the dry seasons occurs region wide irrespective of terrain elevation (**Figure 11**). This finds explanation in the seasonal north-south migration of a pan-equatorial band of enhanced cloudiness and rainfall known as the Inter Tropical Convergence Zone (ITCZ)[48]. The slight reduction in rainfall experienced over several weeks along the CND in January and February reflects much more pronounced dryness to the north in Uganda; conversely, the more defined mid-year dry season along the CND spanning June through August is associated with enhanced southeasterly airflows that effectively push the zone of atmospheric convergence promoting rainfall across the equator into Uganda.

In this light, an unusual finding from the EAGLE project's high-resolution modeling studies is that the CND landscape has a heightened risk of major change in climatic seasonality. By the 2055-64 period: the mid-year dry season effectively disappears. Being the output of a single model run under a high-end greenhouse gas emissions scenario may make this seem implausible; It is highly dissimilar from mid-century predictions of the consensus of global models, which sustain the dry season. It finds corroboration, however, in a new study on East African rainfall, which found that the parameterization of convection in global models may be a source of uncertainty for projections of changes in seasonal timing, and that potentially impactful changes in seasonality are therefore quite plausible[49]. Such an eventuality is exceptionally difficult to plan for, and since it would only come to fruition well after the project period, if at all, additional studies could be conducted to provide needed guidance.

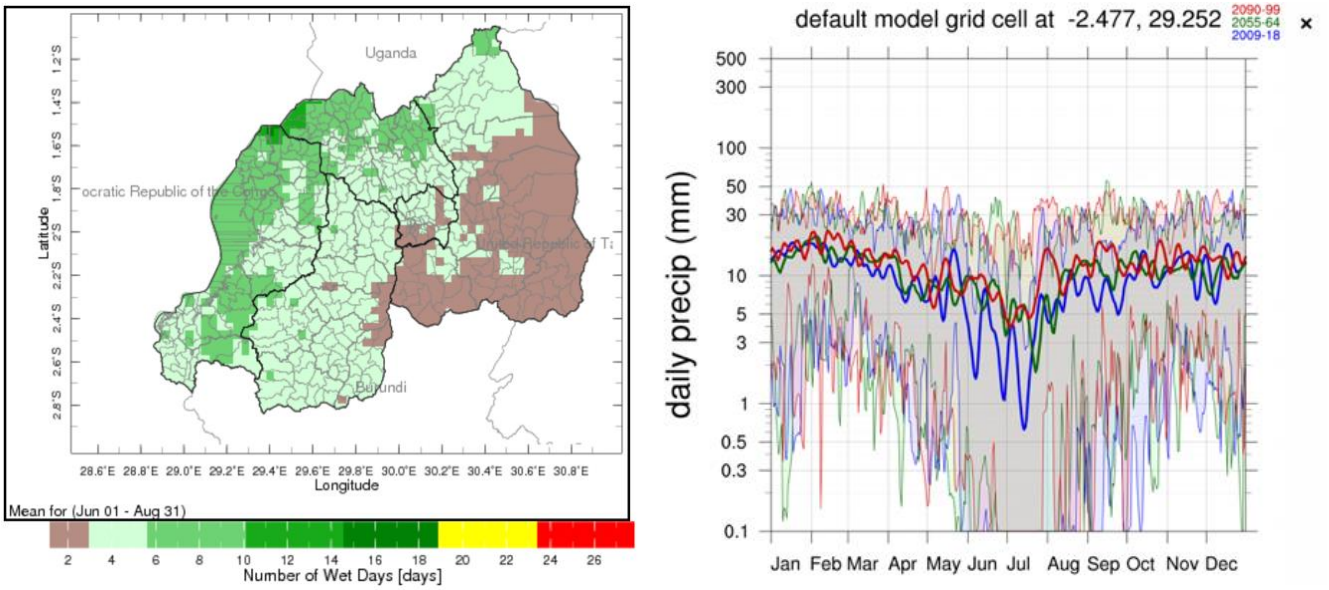

Figure 11. (**left**) The average number of "wet" days in Rwanda with rainfall exceeding 3 mm for the months of June-August. The wettest parts of the CND only receive significant rainfall on ~10% of days during the dry season. Source: Meteo Rwanda[50]: (**right**) Annual cycle of rainfall rate (mm/day, note logarithmic scale) at Nyungwe Forest National Park showing daily means (thick lines) and extremes (thin lines) for 10-year time periods centered on 2014 (blue), 2060 (green) and 2095 (red). The dry season evident in the 2014 mean reaching below 1 mm/day, effectively disappears by the 2060 time period. Source: EAGLE project[51]

48 Siebert, A., Dinku, T., Vuguziga, F., Twahirwa, A., Kagabo, D.M., delCorral, J. and Robertson, A.W., 2019. Evaluation of ENACTS-Rwanda: A new multi-decade, high-resolution rainfall and temperature data set—Climatology. *International Journal of Climatology*, *39*(6), pp.3104-3120.

49 Wainwright, C.M., Marsham, J.H., Rowell, D.P., Finney, D.L. and Black, E., 2021. Future changes in seasonality in East Africa from regional simulations with explicit and parameterized convection. *Journal of Climate*, *34*, pp.1367-1385.

50 ENACTS online tool at Meteo Rwanda. Link

51 EAGLE project: Link

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- **Climate risks, vulnerability and impacts**

Without strategic actions to confront mounting stresses borne by climate change interacting with unsustainable land-use practices, the CND would doubtless undergo a profound transformation over coming decades with significant loss of biodiversity and ecosystem services, reducing agricultural potential, severe hazards to humanity and loss of livelihoods. Temperature increase and loss of fog immersion will cause desiccation of the lower margins of protected forests promoting die-offs, arrival of pests, pathogens and invasive species, and increasing fire ignition potential. Current cultivation practices of both subsistence crops and valuable cash crops like tea and coffee will be drawn uphill, adding to pressure to convert protected forests to farmland. Whereas climatic changes will act as inexorably mounting stressors, unsustainable land surface conversion and land use practices will greatly exacerbate their impacts. The steep hillsides that characterize much of western Rwanda will experience intensifying erosion and risk of landslides, while built infrastructure such as road and bridges will be overwhelmed since they were engineered to withstand rainfall intensities expected under past climatic conditions that are sure to be exceeded, and with increasing frequency, as time progresses and temperatures steadily increase. Precipitation intensity will increase for short-period rainfall rates and individual storm totals, especially for the fraction of higher-end events that can cause flash flooding and promote landslides. This is certain to occur, is probably already discernible, and likely to amplify very significantly over time as warming progresses. This ties directly to landslides in particular, which already cause high mortality and significant destruction each year, and the CND's elevated vulnerability due to high topographic relief and deforested slopes makes this hazard of paramount concern to address (**Figure 12**).

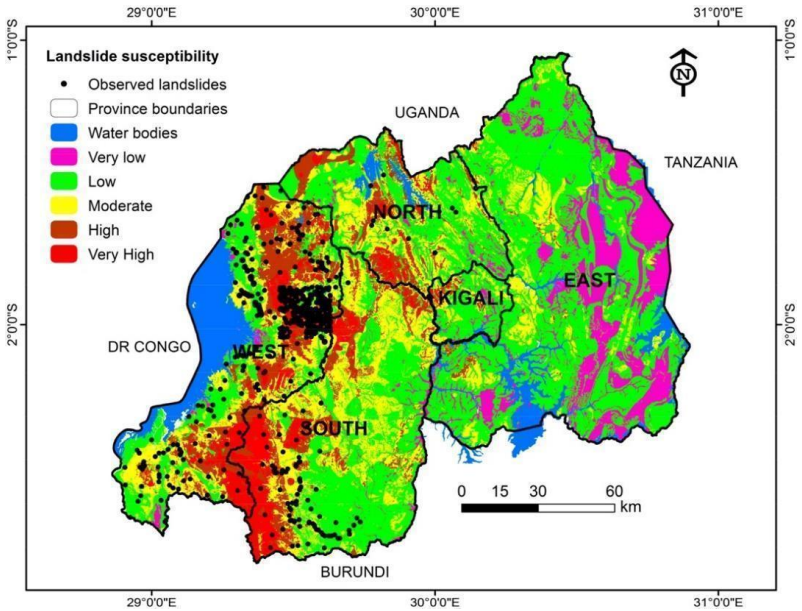

Figure 12. Rwanda landslide susceptibility map showing past observed landslides. Source: Nsengiyumva et al., 2018.[52]

Significant temperature increases are almost certain to continue for decades to come, and will have mounting impacts on both natural and human systems along the CND, and some are already discernible. Over equatorial Africa observed environmental lapse rates feature temperature decreases by approximately 5.5 °C per kilometer of elevation increase[53], so 2 °C of warming expected by mid-century translates to a vertical rise on the order of 473 meters, promoting large uphill displacements of a wide range of organisms,

52 Nsengiyumva, J.B., Luo, G., Nahayo, L., Huang, X. and Cai, P., 2018. Landslide susceptibility assessment using spatial multi-criteria evaluation model in Rwanda. *International journal of environmental research and public health*, *15*(2), p.243.

53 Camberlin, P., 2018. Climate of Eastern Africa. In *Oxford Research Encyclopedia of Climate Science*. Link

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ecological processes, cultivars and human activities. While temperatures over the CND region are not expected to rise to levels for heat stress to elevate mortality[54] or reduce labor productivity, the indirect effect of rising temperatures through increased disease incidence is substantial[55].

Western Rwanda is the most productive region in the country for the cultivation of both tea and coffee, where conditions are optimized on the CND's sloping terrain. Both are cash crops with high export value, and are the target of active expansion through both governmental programs and private enterprise. Intensifying environmental stresses from climate change particularly due to thermal increases and the arrival of invasive pests from lowland regions, present challenges both for current plantings and in planning for expansion to new areas; the same concerns apply to other cultivars.

Cloud base altitude, which is highly influential in montane forest ecology and species composition, is likely already elevated above recent past conditions due to conversion of forests to agricultural lands, and certain to rise further in proportion to the degree of warming over coming decades. Ecosystems and species assemblages in the lower reaches of protected forests may already be out of balance with this important environmental variable, and this imbalance will only increase over time, promoting rapid species turnovers, enhancing potential for invasives, and act as a strong driver of upward range extensions. Rising cloud bases in concert with warming temperatures also increase drying of vegetation, enhancing wildfire risk during rain-free periods. Fog interception by vegetation also augments montane forest precipitation by an estimated 10%, so rising cloud bases will act to remove this important hydrological input too. Highland forest loss therefore represents a local loss to the ecosystem service of rainwater provision that could be partially restored through reforestation.

Such challenges highlight how essential highland forests are to the climatic resilience of CND communities, for the ecosystem services and products they provide for both the region's vulnerable communities and the national economy. They also recharge aquifers; regulate water flow; control flooding; retain soil; provide wood fuel energy and timber; underpin the country's tourism, which provides the largest contribution to Rwanda's foreign exchange earnings[56]; and provide wider benefits of atmospheric pollution control that sustain the country's economy and the wellbeing of its people[57].

Forest conversion to farmland in the CND highlands has until recently served as a release valve for lowland population pressure at the expense of drastically reduced national carbon stocks, diminished resilience to climate change, enhanced potential for destructive outcomes, reduced ecosystem service provision and disrupted biological connectivity. The resultant loss of ecosystem services and functioning and intensifying environmental stresses borne by climate change now require redirection towards forest restoration and other actions to ensure a sustainable future. Safeguarding the Congo-Nile Divide's remaining highland forests, and setting long-term goals of reforesting functional linkages connecting them, therefore serve Rwanda's national long-term interests on lessening the severity of impacts of climate change and sustaining critical ecosystem services both locally and downstream, while contributing to global efforts to draw down greenhouse gas concentrations.

B.1 (b). Summary of spatial biodiversity assessment

The majority of Rwanda's remaining montane forests are restricted to the national parks, which support a variety of threatened and endemic species. A few fragmented forest patches are situated outside of the National Park boundaries. Landcover change (especially for widespread smallholder agriculture), fuelwood

54 Asefi-Najafabady, S., K. Vandecar, A. Seimon, P. Lawrence and D. Lawrence, 2018: Climate change, population and poverty: vulnerability and exposure to heat stress in East Africa. *Climatic Change*, 148, 561-573.

55 World Bank, 2022: Rwanda Country Climate and Development Report. World Bank, Washington DC. Link

56 Rwanda Development Board 2017 Annual Report Link

57 Andrew, G. and Masozera, M., 2010. Payment for ecosystem services and poverty reduction in Rwanda. *Journal of sustainable development in Africa*, *12*(3), pp.122-139.

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harvesting, and human-induced fires, coupled with climate change impacts, especially landslides, erosion and downstream flooding, have compromised the delivery of critical ecosystem services derived from these forests. A detailed spatial analysis of biodiversity in the Congo Nile Divide was conducted to delineate priority areas for the long-term conservation and restoration of forests, and the sustainable management of landscapes, in order to secure the ecosystem services needed to improve the resilience of vulnerable communities to climate change impacts.

The spatial biodiversity assessment for Rwanda's Congo-Nile Divide (CND) (see details in Annex 2 and Annex 2.2) is based on a rapid systematic conservation plan, using MARXAN decision-support software. The key analyses involved identifying and mapping the remaining areas of natural forest and other ecosystem types, modeling bioclimatic change and identifying climate change refugia, a Condatis landscape connectivity and bottlenecks analyses, and evaluating ecosystem threat and protection levels. The analyses thus build in landscape connectivity, climate change refugia, biodiversity values, ecosystem services and social costs.

The final outcome of the MARXAN and Condatis connectivity analyses split the CND domain into four major landscape categories with a set of priority implementation areas, each with their own place-bound project interventions. Interventions range from the restoration of natural forest, establishment and improvement of protective forest on steep slopes and along riparian areas; and to implement biodiversity-friendly agroforestry to reduce landslides, erosion and downstream flooding. Over and above these place-bound interventions are a variety of other mechanisms for promoting the sustainability of rural livelihoods and protecting montane forest in Rwanda's CND landscape.

The Systematic Conservation Plan analyses covered a range of biodiversity features, including:

- Terrestrial ecosystems, including their IUCN Red List threat status and protection level. The analysis focussed on identifying priority remaining intact areas, based on the development of a map of ecological condition.
- Protected Areas, Protected Forests and Protected Wetlands. All the identified ecosystems to be gazetted for protection are included.
- Climate change refugia based on projected changes in bioclimatic envelopes under a range of climate change scenarios.
- Identification of key landscape linkage areas and bottlenecks.
- Hydrological process areas – Rivers and Streams, including buffers.
- Hydrological process areas – Wetlands and Lakes, including buffers.
- Hydrological process areas – Areas with high rainfall.
- Landscape process areas - Steep slopes (over 55%) which are most important for minimizing erosion and landslide risk.

Individual species were not separately considered in the assessment as all key species are tightly linked to their underlying intact habitat (in particular intact forest patches as well as wetlands and riparian areas); and available distribution data for species was much broader than the ecosystem data. In selecting priority conservation areas, the SCP methodology always attempts to be spatially efficient by meeting conservation targets in as small an area as possible, while avoiding conflict with other land users, at the lowest possible cost for other sectors. The following was taken into account in the prioritization:

- Urban and dwellings, tea, roads, plantations, cultivated pasture, coffee, bamboo and agriculture.
- Areas of greatest population density.
- Areas with highly impacted land cover classes.

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Results of the MARXAN spatial analysis:

The MARXAN landscape prioritization (**Figure 13**), which builds in landscape connectivity, climate change refugia, biodiversity values, ecosystem services, and social costs (in terms of avoiding, where possible, areas with highest population density, agriculture etc), splits the landscape into four key planning categories (**Figure 14**):

- **Core Protected Area (PA) Nodes:** National Parks comprise the "Core PA Nodes" that need to be secured and well managed, which include Volcanoes, Gishwati-Mukura and Nyungwe National Parks. Priority activities include strengthening PA management and sustainability, rehabilitation and restoration of natural forests, other conservation-oriented land use activities that reduce stress on PAs and natural forests (e.g. improved wood stove efficiency to reduce pressure on natural forests) and supporting sustainable biodiversity compatible activities (e.g. improved beekeeping). These nodes also include buffer areas around the National Parks.
- **Stepping Stones:** These are priority nodes outside of the current National Parks that are critical for maintaining landscape connectivity, consisting of small, isolated patches of forest, at Dutake and Karehe-Gatuntu Protected Forests and the extensive Gishwati Pastures. These areas would be a sensible focus for some (patches of) forest restoration and protection, beekeeping and energy efficient stoves. The Gishwati Pastures are a focus for agroforestry on pastoral land to increase the coverage of native trees to secure reasonable landscape connectivity for forest species.
- **Landscape linkages:** These are key landscape linkages and knickpoints in the farming landscape that require afforestation on steep slopes and riparian areas to link the CND at a landscape scale. Compatible land use activities include agroforestry, increasing the use of native species, reforesting steep slopes, beekeeping and energy efficient stoves. **Note that the analysis is based on some level of improved connectivity via patches of protective forest and riparian strips, as well as overall improved species composition and tree coverage (within mixed agroforestry systems). It does not imply a continuous natural forest corridor; as this potential no longer exists, and its creation would not be possible in this highly used landscape without unacceptable impacts on livelihoods.**
- **Broader Farming Mosaic:** These are broader areas of moderate priority where conservation interventions can support broader sustainable landscapes and ecosystem service delivery but are likely to be beyond the scope of most project interventions except for those linked to land use planning.

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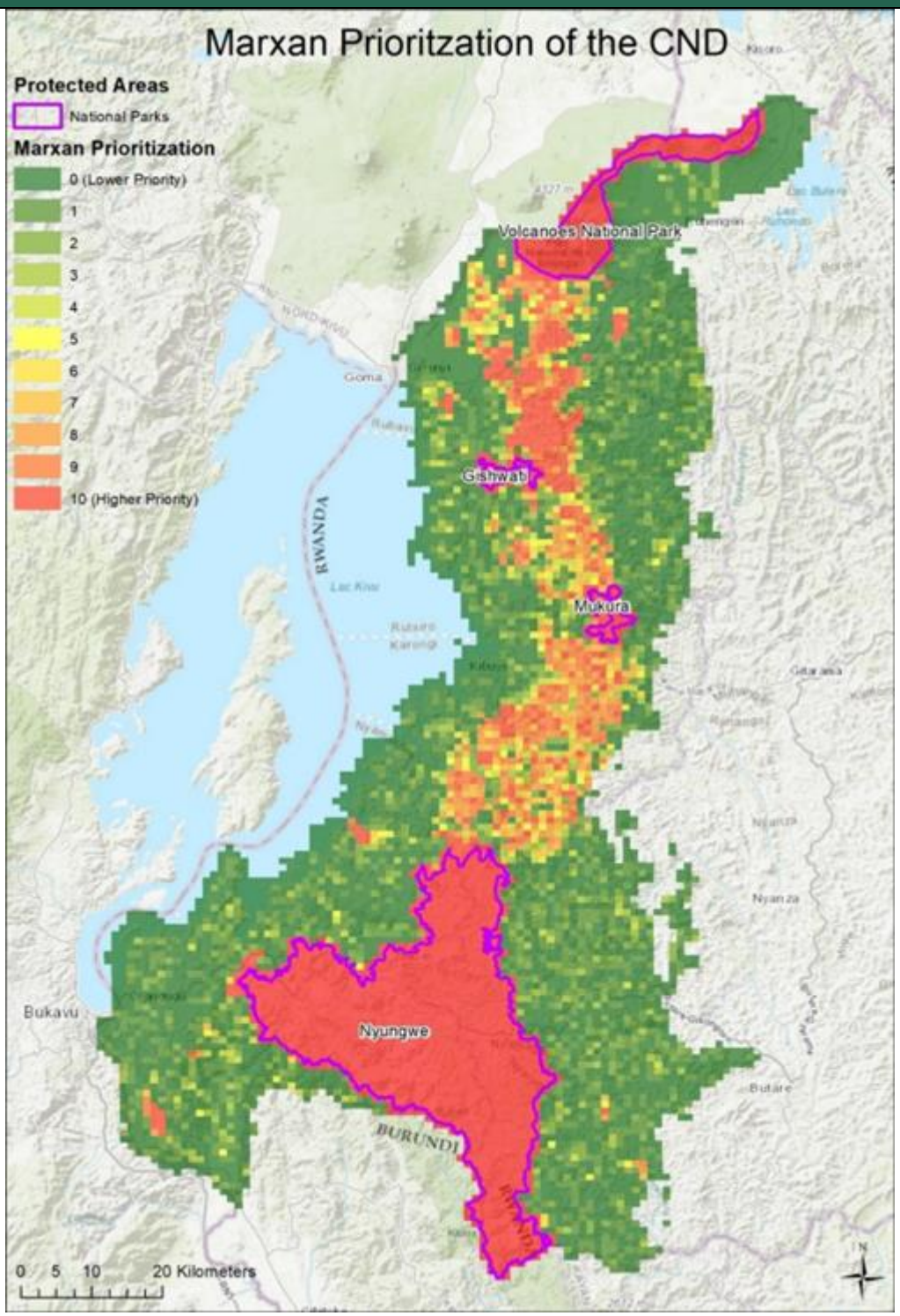

Figure 13. The MARXAN irreplaceability map for the Congo Nile Divide showing the landscape prioritization, ranging from high priority in red to low priority in green.

To aid prioritization and description of the landscape categories above, the four categories were further split into specific planning areas, referred to as “Landscape Implementation Sectors”, as shown **Figure 14** and in **Table 2** with a description of each planning category and associated ideas, required outcomes, core benefits and associated benefits in **Table 3.**

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Table 2. Summary table of landscape categories and associated implementation sectors for the CND.

Landscape Category	Landscape Implementation Sector	Area (ha)
Core PA Nodes	Volcanoes NP and "Buffer"[58]	19 487,0
	Nyungwe NP and Buffer	116 794,9
	Mukura NP and Buffer[59]	4 713,5
	Gishwati NP and Buffer[59]	4 013,7
Stepping Stones	Gishwati Pastures Stepping Stone	15 547,4
	Karehe-Gatuntu Stepping Stone	401,1
	Dutake Stepping Stone	903,0
Landscape Linkages	Nyungwe NP to Mukura NP Linkage	23 375,4
	Gishwati NP to Volcanoes NP Linkage	5 014,8
	Mukura N to Gishwati NP Linkage	7 823,7
Broader Farming Mosaic	Nyungwe to Mukura Broader Farming Mosaic	21 164,4
	Volcanoes Broader Farming Mosaic	11 694,4
	Mukura Broader Farming Mosaic	4 814,0
	Gishwati Broader Farming Mosaic	28 433,2
	Nyungwe Broader Farming Mosaic	11 437,0

Priority Areas for Implementation Activities:

Specific priority areas for a range of interventions were spatially identified, including:

- Natural forest rehabilitation and restoration with the National Parks (and their buffers) and in the Stepping Stones.
- Protective forests for steep slopes and riparian areas, particularly in the Landscape Linkages.
- Agroforestry interventions in key highland Landscape Linkages.
- Specific agroforestry priorities on pastoral land (silvo-pastoral practices).
- Indigenous shade trees for tea and coffee plantations.
- Beekeeping in National Park buffers and Stepping Stone buffers.

[58] *Note that buffers refer to both the specific legally designated buffers around Nyungwe and Gishwati-Makura NPs, as well as broader buffer areas adjacent to all these NPs, as well as Volcanoes NP.*

[59] *In order to allow for specific landscape description, we separately refer to Gishwati NP and Makura NP where necessary, even though these areas are managed as Gishwati-Makura NP.*

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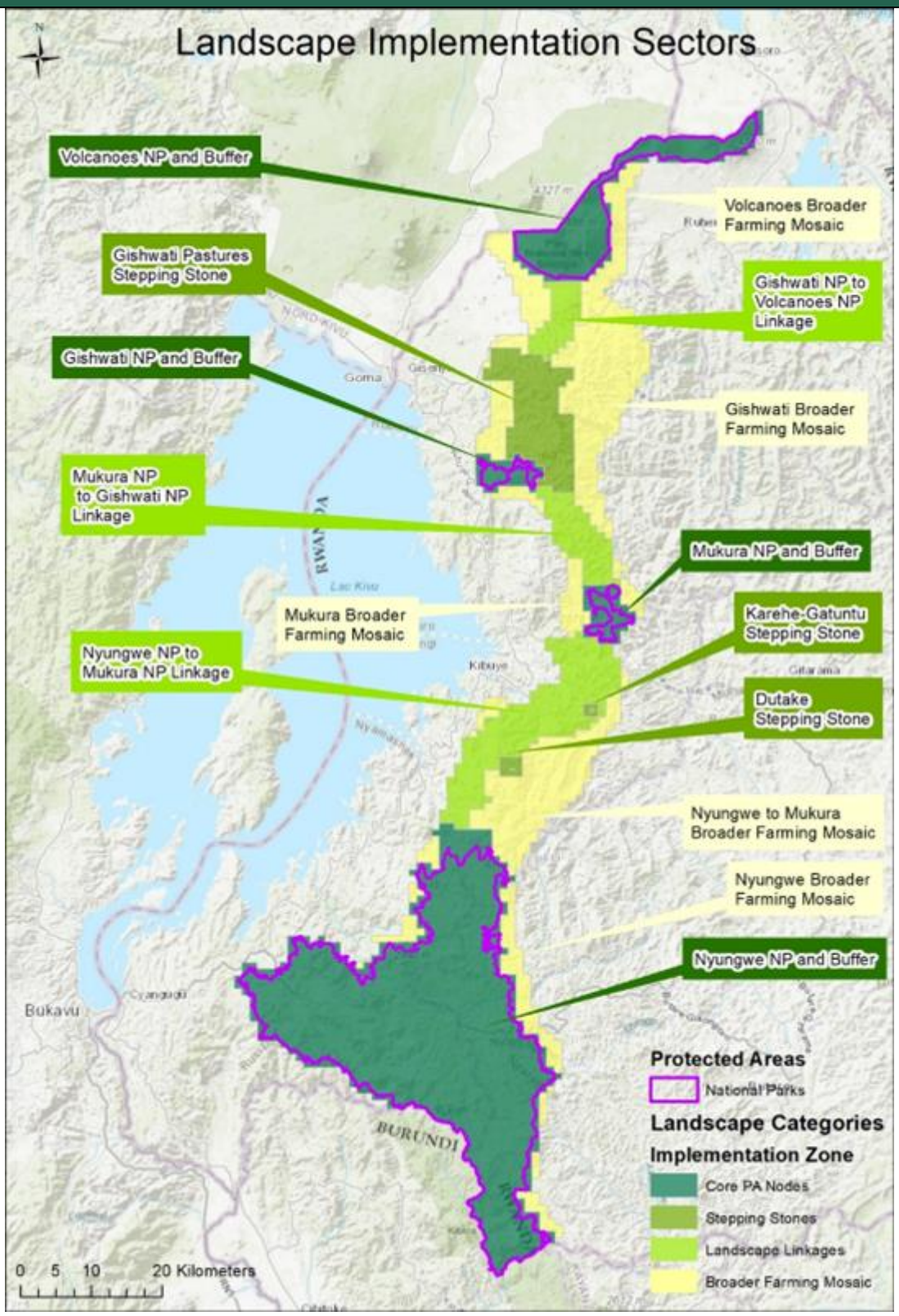

Figure 14. The four major landscape categories (Core PA Nodes, Stepping Stones, Landscape Linkages and the Broader Farming Mosaic) were split into specific areas to aid prioritization and description.

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Table 3. A description of the four key landscape planning categories and associated ideas, required outcomes, core benefits and associated benefits.

Landscape Component	Core PA Nodes The National Parks	Stepping Stones Priority nodes outside of current Pas	Landscape linkages Key landscape linkages and knickpoints in the farming landscape	Broader Farming Mosaic The broader landscape mosaic	Institutional issues
Description	The current core national parks and protected forests.	Critical pieces of biodiversity outside of the PAs required for landscape connectivity, maintenance of biodiversity and delivery of ecosystem services.	The parts of landscape within identified key corridors, where functional connectivity and ability to deliver ecosystem services needs to be urgently maintained or improved.	Remaining farmland areas of the CND.	The non-geographic specific elements of the CND system
Key ideas	Protect and manage for climate resilience.	Restore and protect to ensure landscape connectivity and ecosystem service delivery.	Functional linked farming landscapes delivering ecosystem services.	Diverse climate change resilient farmland delivering ecosystem services.	Strong, well-capacitated and equitable environmental governance and land use planning.
Required Outcome	PAs effectively protect and manage natural forests improving resilience to climate change impacts and risks. Natural forests protected, connected, more resilient to climate change impacts and risks.	Critical landscape nodes / stepping-stones are secured and where necessary restored to a natural state.	Priority portions of the farming landscape are specifically managed to improve overall connectivity and ecosystem service delivery.	Sustainably managed farmland landscape is more biodiverse, supports delivery of ecosystem services and is resilient to climate risk.	Government and civil society are well capacitated to ensure robust landscape planning that supports climate resilience.
Core benefit	Maintain globally significant, species-rich natural forests. Core areas secure best possible source and/or refuge areas for species under climate change.	Biodiversity value of critical landscape nodes is maintained. Landscape connectivity supported through retention of key stepping-stones for species movement across the landscape.	Improved connectivity of the landscape ensures long term climate resilience. Value of core PAs and priority nodes is retained (i.e. the inevitable degradation of sites due to isolation is avoided).	Generally improved farmland management ensures rural sustainability and supports livelihoods.	Integrated land use plans, with community participation and spatial planning tools/ monitoring
Associated benefits	Improved delivery of ecosystem services (especially water) and support of rural economies and livelihoods.	Improved delivery of ecosystem services (especially water) and support of rural economies and livelihoods.	Improved delivery of ecosystem services (especially water) and support of rural economies and livelihoods.	Improved delivery of ecosystem services (especially water) and support of rural economies and livelihoods.	Cross sectoral planning and management.

This study was a rapid assessment to support project proposal development and does not replace a full conservation planning process. There are significant additional steps which are required to develop a product that is useful for land use planning during project implementation. These changes include a robust stakeholder engagement process, at a national, district and local scale; incorporation of issues relating to

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land use rights, both of landowners and farm tenants; incorporation of issues relating to social safeguards, especially for marginalized groups; inclusion of issues related to planning processes and strategies, at a national and local scale; finer scale planning (ideally at a 1:50 000 scale); and improved biodiversity data, including revised data on forest degradation, validation of the ecological condition map, and specific species data where possible.

B.2 (a). Theory of change narrative and diagram

The theory of change for this Project is founded on several key principles. Central to all, the CND represents a complex landscape – a geospatial mosaic of forest and farming patches, each dependent on the other. These coupled, biological and socio-economic systems are under great strain due to intense land pressure, which has resulted in a negative cycle of natural resource degradation that undermines the well-being of both natural and socio-economic systems. The advent of climate change is a forceful driver that intensifies this cycle of degradation, with the resultant loss of key ecosystem services that importantly link forests and people. This cycle must be disrupted in order to chart a path toward climate resilience for natural and human systems. Ecological connectivity must be established within this mosaic of land uses to promote landscape heterogeneity to help build resilience to climate change of forest ecosystems and people who depend on them. The approach to be taken by this Project is therefore based on principles of ecosystem-based adaptation: that healthy and resilient ecosystems form an essential foundation for adaptation to climate challenges[60]. Climate-aware management of both natural and human-dominated ecosystems – interacting and integrated at a landscape level – can break the cycle of degradation and instead lead to a positive sequence of mutually reinforcing, climate-smart, sustainable, and resilient benefits..

In sum, the goal statement of the Project is:

IF *Rwanda's CND landscape of native forests and neighboring farmlands is effectively managed for climate resilience*

THEN *the CND will comprise an interconnected and interdependent set of globally significant, species-rich natural forests in a matrix of sustainable farmlands, acting as buffers against damage from extreme weather events: assuring landscape integrity, stability and adaptability, providing vital ecosystem services and improving livelihoods for vulnerable people and the nation at large and contributing importantly to the conservation of biodiversity, the national economy, and mitigation of GHGs*

BECAUSE *building the capacity and management of integrated, climate-resilient forest and farming systems will ensure natural forest perpetuity and break and reverse the climate change-induced intensifying cycles of drought, flooding, and landslides that lead to degradation of livelihoods and resultant increased pressure on forest resources.*

The status and future of the CND's forests and people are tightly intertwined: both heavily dependent on the natural resources and processes that provide a foundation for their ability to thrive. They represent ecological and socio-economic systems that are importantly coupled in a complex landscape, linked in particular by the ecosystem services that flow throughout these systems (hydrological and microclimate regulation, soil conservation, and nature-based tourism). At present these services, and the consequent relationships between forests and people – especially those who are most vulnerable in Rwandan society – are deeply

60 Scarano, F.R. et al, 2017. *Ecosystem-based adaptation to climate change: concept, sustainability and a role for conservation science,* Perspectives in Ecology & Conservation 15(2), 65-73.

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strained[61]. Forests have been reduced in extent, fragmented, and degraded by fire[62], overuse of resources[63], and introduction of exotic species[64]. The sharply sloped rural lands of the CND have been farmed more and more extensively and intensively on steeper and steeper slopes[65,66] and throughout riverine bottomlands, further reducing tree cover outside forest blocks: thereby further compromising the ability of the land to retain soils[67], avoid flooding[68], provide consistent and healthy water[44], ameliorate microclimate[49], store carbon[69], and remain productive. The coupling of these stressed systems has led to a negative feedback cycle of insecurity and constrained the well-being of farmers. Having little access to alternative sources of livelihoods or capital to enable change[70], smallholder farmers have consequently increased pressures on natural forests for land, fuel, and other forest resources[46]. Such pressures in turn cause further forest loss and degradation and decline in biodiversity – reducing their ability to provide essential ecosystem services to people living in the landscape and across the nation, including tourism revenues and employment that are of national import. Thus, these systems are caught in a negative cycle that has proven difficult to break, despite significant sector-specific efforts. One such pressure – demand for fuelwood – is quite substantial given that a recent Government of Rwanda (GoR) census found that 77% of Rwandan households use wood as their primary fuel for cooking[71].

With the advent of climate change, these already strained systems are showing clear signs of breakdown. Increased variability in the timing and intensity of rains along with rising temperatures are causing increased landslides[72] and soil erosion[50], increased desiccation and drought[50], and unpredictable timing for agricultural plantings and harvest[73]. This is reducing farm productivity and security, driving even greater pressures on the remaining forested estate, thereby compromising further the essential ecosystem services that are necessary to such well-being. At a larger scale, climate-induced forest degradation and decline of biodiversity in the CND compromise national-level benefits of water provision and quality[1], nature-based tourism[74], the supply of hydroelectricity,[7,75] and carbon storage[10] [see diagram A below].

61 Bagstad, K.J., 2019. *Towards ecosystem accounts for Rwanda: Tracking 25 years of change in flows and potential supply of ecosystem services.* British Ecological Society.

62 Masozera, A.B., Mulindahabi, F., 2007. *Post-Fire Regeneration in Nyungwe National Park*, Rwanda. Wildlife Conservation Society.

63 Republic of Rwanda, 2011. *Green Growth and Climate Resilience: National Strategy for Climate Change and Low Carbon Development*.

64 USAID, 2019. *Rwanda Tropical Forests and Biodiversity Analysis*.

65 Camberlin, P., 2018. *Climate of Eastern Africa*. In Oxford Research Encyclopedia of Climate Science.

66 Seimon, A., 2022. *An Overview of Climate Change and its Impacts along the Congo-Nile Divide in Rwanda*.

67 World Bank, 2019. *Rwanda Systematic Country Diagnostic*.

68 Karamage, F., et al., 2017. *Modeling Rainfall-Runoff Response to Land Use and Land Cover Change in Rwanda (1990–2016)*. Water 2017, 9(2), 14.

69 Mugabowindekwe, M., Brandt, M., Chave, J. et al. Nation-wide mapping of tree-level aboveground carbon stocks in Rwanda. Nat. Clim. Chang. 13, 91–97 (2023). https://doi.org/10.1038/s41558-022-01544-w

70 Clay N., King B., 2019. *Smallholders' uneven capacities to adapt to climate change amid Africa's 'green revolution': Case study of Rwanda's crop intensification program*. World Dev.

71 Government of Rwanda, 2021. Rwanda Household Survey 2019/2020. National Institute of Statistics of Rwanda.

72 Uwihirwe, J., et al., 2020. *Landslide precipitation thresholds in Rwanda*. Landslides.

73 World Bank; CIAT. 2015. *Climate-Smart Agriculture in Rwanda*. CSA Country Profiles for Africa, Asia, and Latin America and the Caribbean Series. Washington D.C.: The World Bank Group.

74 Rwanda Environment Management Authority (REMA), 2015. *Rwanda State of Environment and Outlook Report.*

75 Rwanda Environment Management Authority (REMA), 2009. *Rwanda State of Environment and Outlook Report*, Chapter 8: Energy Resources.

(b) PROJECT/PROGRAMME INFORMATION

Diagram A. Climate impacts & risks intensify negative feedback loop for people & forests

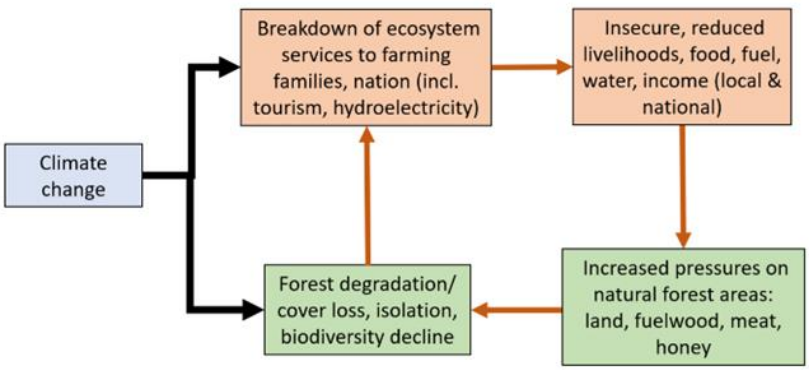
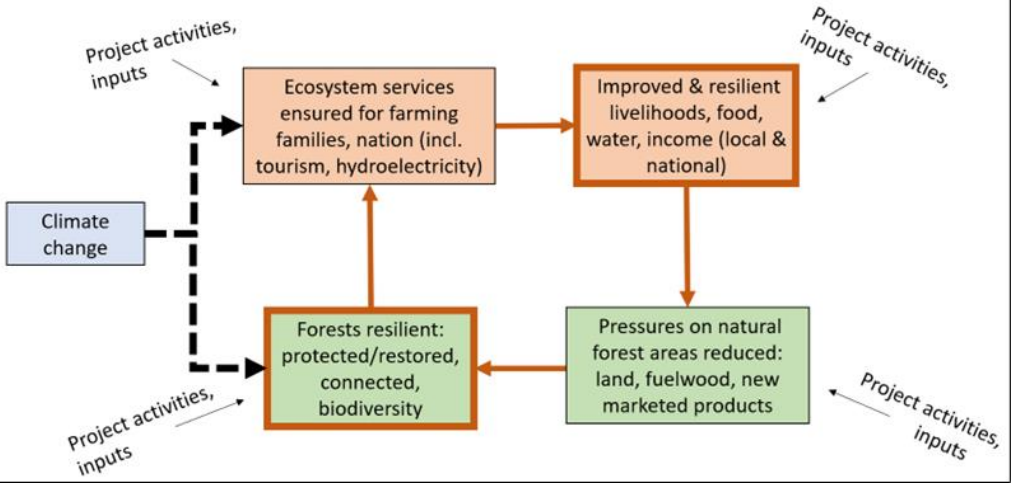


Diagram B. Adaptation to climate impacts & risks promotes positive feedback loop for people & forests



This context calls for new mechanisms of land-use planning and management that are based on consideration of the CND as a landscape, consisting of an inter-dependent mosaic of forests and farms, the management of each determining the health of the whole. Focusing on this larger scale, with coordination across geographic and sectoral boundaries, while mainstreaming climate risks into management planning will be key – and the foundation for a paradigm shift. Use of this framework to design and apply practical, precedent-setting Project actions in-forest and on-farm is expected to shift mindsets and management systems. This, in combination with establishing durable sources of financing, is thereby intended to shift the natural and human ecosystems themselves toward sustainable climate resilience. [see diagram B above, and the ToC (Theory of Change) diagram below.

B

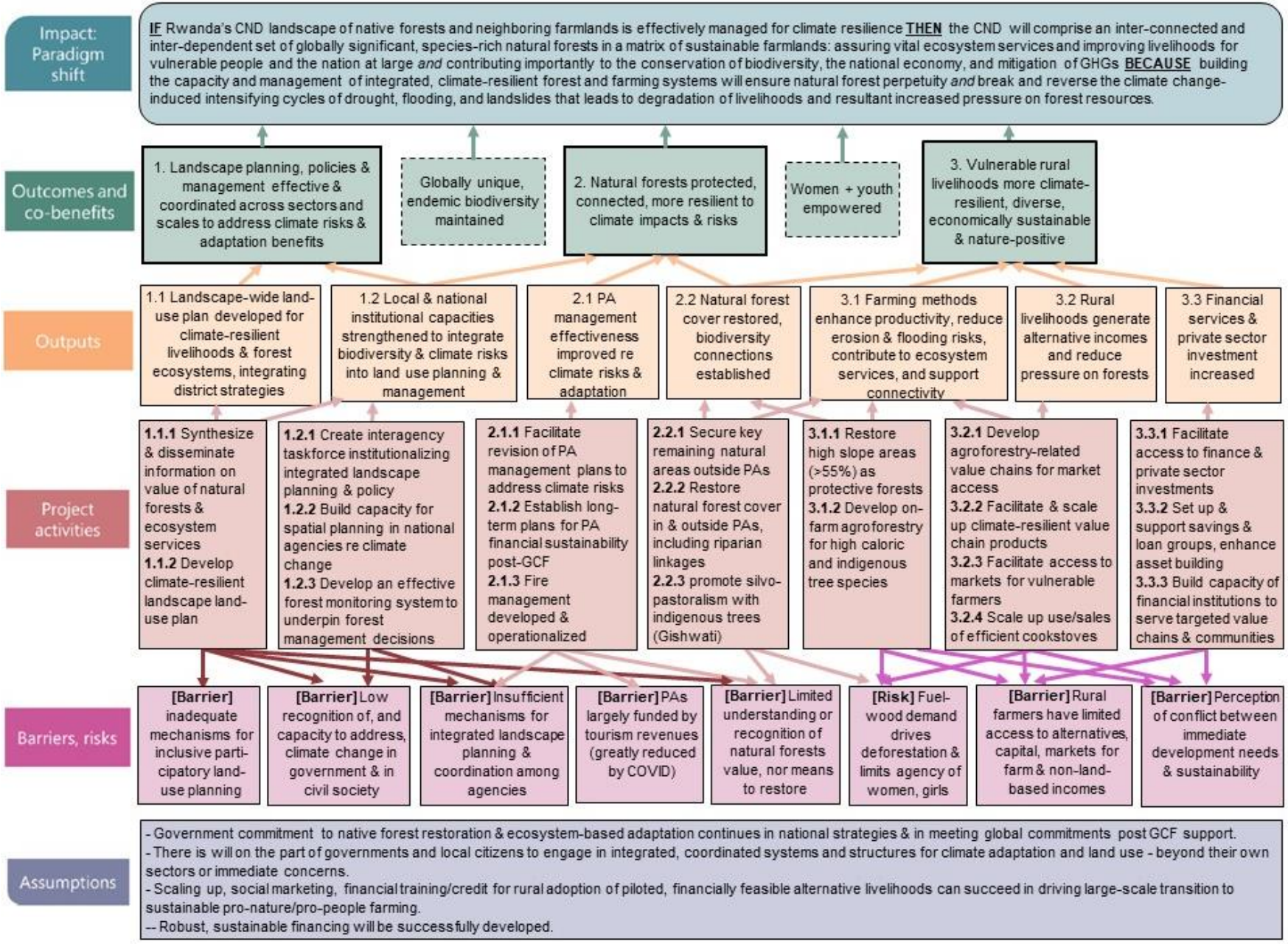


Figure SEQ Figure * ARABIC 15. Theory of change

Outcome 1. Landscape planning, policies and management are effective and coordinated across sectors and scales to address climate risks and adaptation benefits. Major barriers currently stand in the way of moving in this direction, as outlined in the ToC diagram. ***Awareness, understanding, attention, and action regarding climate risks to natural resources are currently insufficient***. Planning and adaptation to climate impacts are constrained by a lack of information, site-focused modeling, spatial analysis, and real-time monitoring. Where some capacity exists, it ***operates within sector initiatives rather than across them***. It also proceeds largely within governmental programs, with ***mechanisms for inclusive land-use planning inadequate*****,** not fully engaging rural peoples – particularly women and youth. Because of these barriers, coordination of landscape planning and management is weak across governmental and non-governmental sectors (agriculture, forestry, national parks, economic development), scales (local, district, national), and actors (women, youth, smallholder farmers, commercial businesses, as well as governmental agencies). Activities outlined in **Component 1**, aimed at integrated landscape land-use planning and the capacity for effective management, are intended to help ensure ecosystem services persist, and thereby align the ties between forests and people as they are faced with climate challenges. Activities under this component will provide the government and public with up-to-date information on climate adaptation (1.1.1), build agency capacities for incorporation into land-use planning – particularly spatial analysis and forest monitoring (1.2.2, 1.2.3), establish mechanisms for integrated landscape planning – including public participation and operations of an inter-agency task force (1.1.2, 1.2.1), and facilitate the creation of a climate-smart, integrated CND land-use plan (1.1.2).

Outcome 2. Natural forests are protected, connected, more resilient to climate impacts and risks. Particular to the CND, another key barrier is that ***natural forests are as yet undervalued and under-resourced*** despite the fact that they play vital roles in stabilizing natural and human CND ecosystems[76,77]. The national parks of the CND (Volcanoes, Nyungwe, and Gishwati-Mukura) are globally significant regarding their outstanding species richness, levels of endemism, and presence of endangered and rare species[78]. Although these are well-recognized for their tourism potential, and strong governmental policy and practice exists to protect them, barriers to their full valuation remains: their ***ecosystem services are yet to be fully recognized*** or financially supported, and their ***support is vulnerable to global tourism trends*** (with COVID-reduced tourism as a current example). As climate change considerations enter into landscape management, the values of these natural forests for fog interception, precipitation infiltration, soil retention, drought mitigation, and hydrological balance are only now becoming more prominent. In order to provide such services into the future, Nyungwe and Gishwati-Mukura NPs are in need of restoration and connection[79,80]. Yet the understanding and capacity for recovering their richness and function is nascent at best, particularly in light of climate change. Activities outlined in **Component 2** are therefore designed with forest sustainability at the core. To build climate considerations into forest planning and management, the Project will facilitate revision of park management plans (2.1.1) that enhance dimensions of fire prevention and management (2.1.3), and will support in-park forest restoration (2.2.2). Establishment of restored forest at park boundaries (2.2.2), riparian linkages outside the parks (2.2.2), and forested “stepping stones” that

76 Gatwaza O.C., Wang X., 2021 *Mapping of biodiversity hubs and key ecosystem services as a tool for shaping optimal areas for conservation.* PLOS ONE 16(8): e0253151

77 Andrew, G., Masozera, M., 2010. *Payment for Ecosystem Services and Poverty Reduction in Rwanda*. Journal of Sustainable Development in Africa (V12, No.3).

78 This area is also significant for global biodiversity – with the Albertine Rift being one of the most biodiverse regions within Africa, including conservative estimates of at least 980 endemic species, 15 Critically Endangered species, 34 Endangered species, and 99 Vulnerable species. Source: Plumptre, A.J., et al. 2016. *Conservation Action Plan for the Albertine Rift*. Wildlife Conservation Society.

79 Nyandwi, E., Mukashema, A., 2011. *Excessive Deforestation of Gishwati Mountainous Forest & Biodiversity Changes*. Participatory Geographic Information Systems (P-GIS) for natural resource management and food security in Africa.

80 Ordway, E., 2015. *Political shifts and changing forests: Effects of armed conflict on forest conservation in Rwanda*. Global Ecology and Conservation.

allow for forest species to move between parks (2.2.1, 2.2.3) is intended to enhance biodiversity and forest functions across the CND landscape. Fundamental to forest sustainability as well is sustainable long-term financing, which will be addressed by providing technical support from the Project to RBD and REMA to assess various financial instruments (conservation and/or water funds, bonds, revenue streams) to be employed for revenue generation post-GCF (2.1.2).

Outcome 3. Vulnerable rural livelihoods are more climate-resilient, diverse, economically sustainable and nature-positive. The sustainability and climate resilience of the agricultural matrix of this landscape is challenged by additional, multiple barriers. Rural agricultural practices and livelihoods are constrained by the very small size of landholdings (avg. 0.3 ha[81]), creating intense pressure to utilize all arable land for food and near-term income-generating products[56], thus creating ***reluctance to incorporate trees or other soil conservation measures on the land***[82]. The resultant ***lack of fuelwood in turn continues to drive deforestation of natural forests***[12]***, and occupies important time for women and youth*** who could instead be engaged in productive and empowering roles. Overall, local communities and extension services[83] have ***limited skills, information and knowledge to design and implement farming methods*** that would enhance their capacity to mitigate the impacts from climate-induced soil erosion, flooding and droughts. Farmers ***also lack access to financial know-how[56] and capital, proven alternative livelihoods, and markets*** that could incentivize and enable change[12]. They are therefore caught in a cycle of immediate need that – without alternatives – forecloses options that could recover and sustain benefits from improved ecosystem services, other forest functions, and new livelihoods. **Component 3** aims to redress these conditions via activities that will demonstrate, incentivize, facilitate, and support actions that maintain and recover ecosystem services, benefit from forest functions and provide alternative on- and off-farm based incomes that reduce pressure on forests. To these ends, the Project will support reafforestation on steep slopes (>55%), on both public and smallholder private lands (Activity 3.1.1). It will develop farm-based agroforestry for climate-resilient species that produce fuelwood and/or market products, while conserving and enriching soils (3.1.2, 3.2.1). The Project will complement land-based production with a scaling-up of alternative value-chain products for smallholders that are nature-positive, including but not limited to tourism-based income, beekeeping, and improved cooking stoves (3.2.2, 3.2.4). Central to these activities will be facilitation of access to market chains (3.2.3) and financial mechanisms for establishing and maintaining businesses (3.3.1, 3.3.2, 3.3.3). Given that these activities are designed at the core to be profitable and promote financial sustainability, it is intended that they be replicable, and sustained once GCF funding expires.

Assumptions. Success in achieving Project outcomes will depend on important assumptions being met, among them that governmental and non-governmental actors will be willing to work in collaboration across sectoral and geographic boundaries; rural adoption of alternative farming and off-farm revenue generation can be scaled up to drive a landscape-level transition to sustainability; financing and revenue-generating mechanisms will be established that assure continuance of initiated actions; and governmental commitment to natural forest restoration and ecosystem-based adaptation continues in national strategies and in meeting global commitments.

The pathways summarized in this ToC are expected to contribute to the overall goal and outcomes of the Project**: natural forests** and **vulnerable communities** will be more resilient and sustainable despite climate impacts, with effective, **coordinated management** across the CND landscape. In doing so, important co-benefits will accrue. Intentional, inclusive engagement in management coordination will **empower women and youth** in environmental thinking and decision making. Forest conservation and restoration, along with agroforestry, will contribute to greater **carbon sequestration and storage,** while fire management and greater cooking efficiency will **reduce GHG emissions**. The globally unique, endemic **biodiversity** of

81 USAID, 2017. LandLinks Country Profile: Rwanda. https://www.land-links.org/country-profile/rwanda/

82 Rwanda Water and Forestry Authority, 2017. *Forest Investment Program for Rwanda*.

83 Foster & Graham, 2014. *Connectivity and the Tea Sector in Rwanda: Value Chains and Networks of Connectivity-Based Enterprises in Rwanda.*

Rwanda's forests, from great apes to rare orchids, will recover on the basis of healthy, more connected and resilient forest habitat.

B.2 (b). Outcome mapping to GCF results areas and co-benefit categorization

Outcome number	GCF Mitigation Results Area (MRA 1-4)				GCF Adaptation Results Area (ARA 1-4)			
	MRA 1 Energy generation and access	**MRA 2** Low-emission transport	**MRA 3** Building, citiies, industries, appliances	**MRA 4** Forestry and land use	**ARA 1** Most vulnerable people and communities	**ARA 2** Health, well-being, food and water security	**ARA 3** Infrastructure and built environment	**ARA 4** Ecosystems and ecosystem services
Outcome 1. Landscape planning, policies & management effective & coordinated across sectors and scales to address climate risks & adaptation benefits	☐	☐	☐	☒	☐	☐	☐	☒
Outcome 2. Natural forests protected, connected, more resilient to climate impacts & risks	☐	☐	☐	☐	☐	☐	☐	☒
Outcome 3. Vulnerable rural livelihoods more climate-resilient, diverse, economically sustainable & nature-positive	☐	☐	☐	☐	☒	☒	☐	☐

Co-benefits number	Co-benefits					
	Environmental	Social	Economic	Gender	Adaptation	Mitigation
Co-benefit 1: Globally unique, endemic biodiversity maintained	☒	☐	☐	☐	☐	☐
Co-benefit 2: Women and Youth empowered	☐	☐	☐	☒	☐	☐

B.3. Project/programme description (max. 2500 words, approximately 5 pages)

Rwanda's CND region is a complex, naturally integrated landscape. Its diverse high elevation forests capture and store water resources, releasing them in a sustained manner throughout the year to surrounding steep hillside and bottomland farms and plantations, before feeding into the national network of wetlands, rivers, and lakes. The Rwanda portion of the CND runs from the Virunga Mountains and Volcanoes National Park (VNP) on the border with Uganda in the north, down through Gishwati Mukura National Park (GMNP), to the south end of Lake Kivu and Nyungwe National Park (NNP) on the southern border with Burundi. These three

national parks contain the country's only remaining montane forests. The boundaries of the CND landscape are defined as all areas greater than 1900m in elevation.

Administratively, the CND overlaps three Provinces (Western, Southern, Northern) and ten Districts (Karongi, Musanze, Ngororero, Nyabihu, Nyamagabe, Nyamasheke, Nyaruguru, Rubavu, Rusizi, Rutsiro).

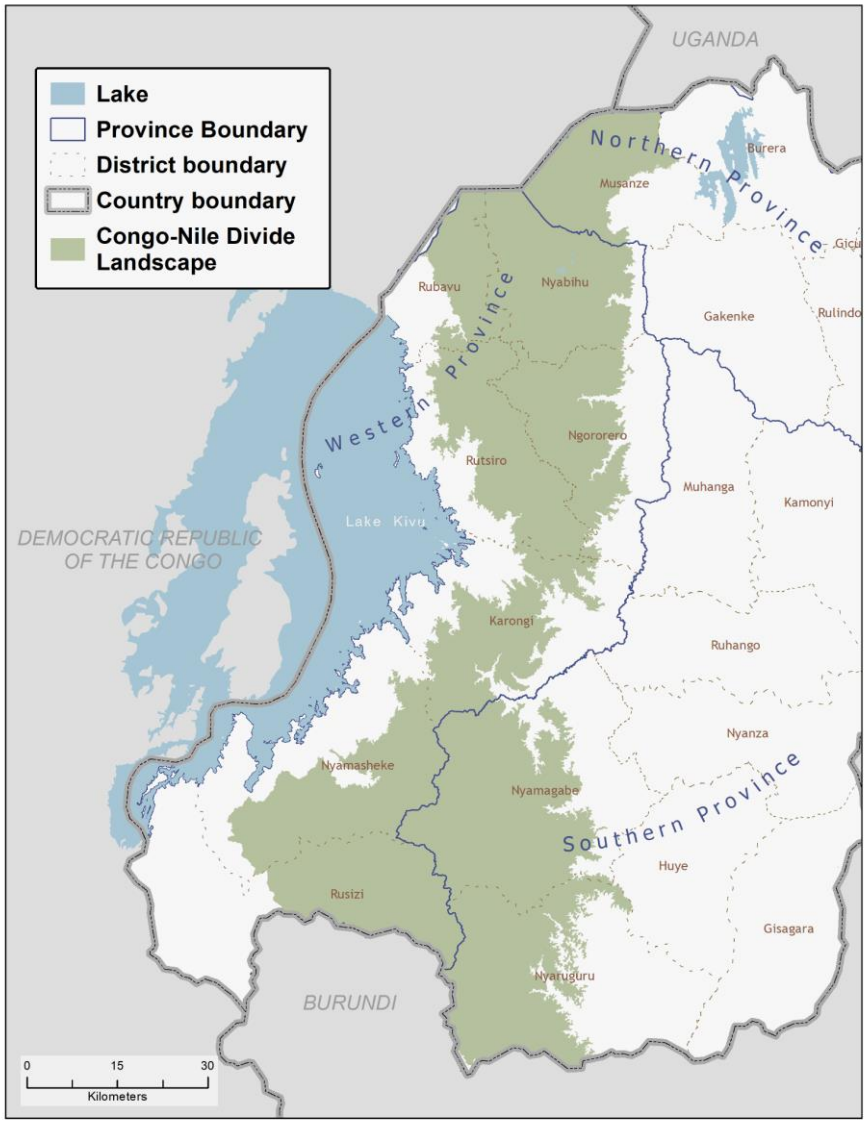


Figure 16. Map of CND Landscape

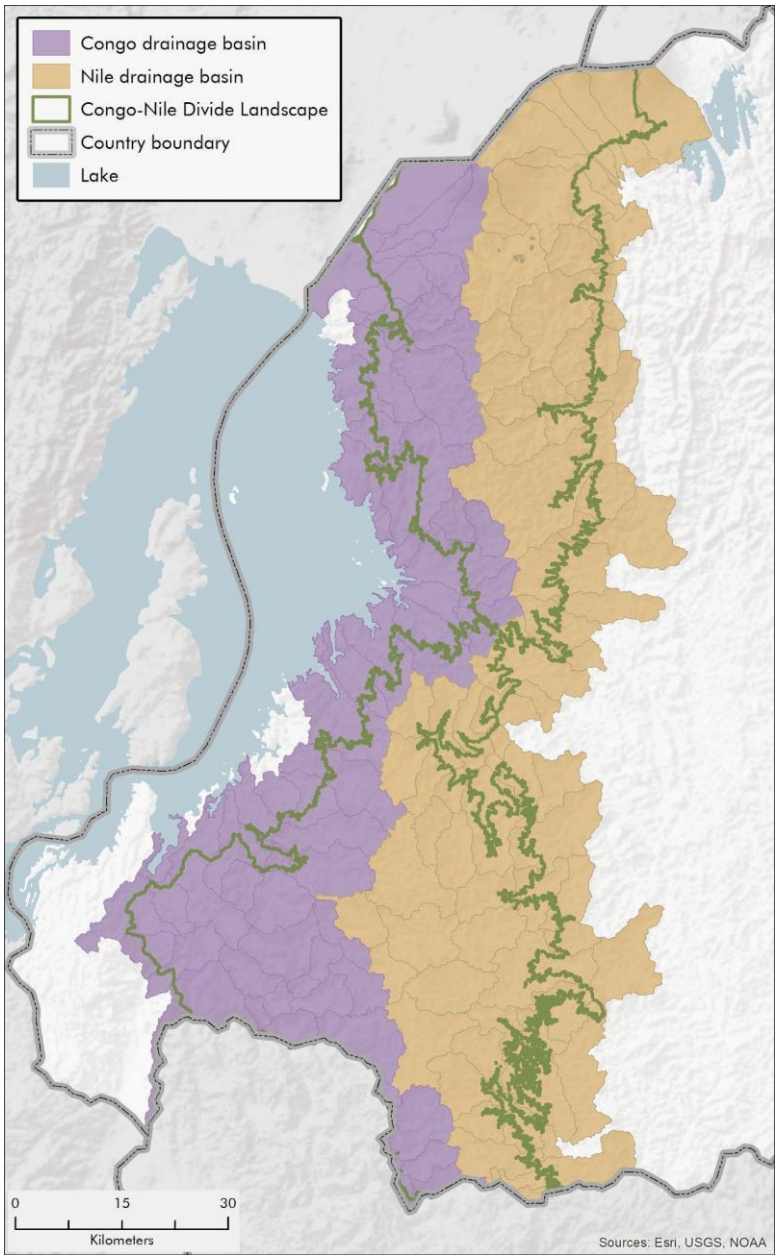


Figure 17. Map of CND Landscape drainage basins

To address the present and intensifying threats from climate change requires that this region also be managed as an integrated and ecologically connected system. This need is recognized in several key policies and plans enacted in recent years by the Rwandan government. However, implementation and integration[84] of these have lagged, their decentralized application on the ground is largely unrealized, and climate-related technical capacity remains limited in key institutions at all levels. This Project is designed to increase the climate resilience of the CND. Its intended outcomes are:

- The development and implementation of effective landscape planning, policies, and management, coordinated across sectors and scales, to address climate risks and adaptation benefits;

84 Bagstad, K.J., 2019. *Towards ecosystem accounts for Rwanda: Tracking 25 years of change in flows and potential supply of ecosystem services.* British Ecological Society.

- Improved protection, restoration, and connection of existing natural forests, with enhanced resilience to climate impacts and risks; and
- The transformation of vulnerable rural livelihoods to be more climate-resilient, diverse, economically sustainable, and nature positive.

The Project has three main components directly targeting vulnerabilities within climate impact chains. Detailed analyses of the underlying rationale are provided in the Feasibility Study (Annex 2). Please see section 4.1 of that study, for a list and description of relevant existing and previous projects in the region.

Component 1: Mainstreaming Climate Adaptation into Integrated Land Use Planning

There is an urgent need for more effective collaboration among Rwandan government agencies, civil society, private sector, and diverse partners to balance difficult-yet-inevitable land use trade-offs that will have profound impacts on the climate resilience of both natural systems and people. The GoR recognizes that a piecemeal approach to decision making has exacerbated competition over scarce land resources and reduced the adaptive capacity of both ecosystems and rural populations[85]. Rwanda's Baseline Climate Change Vulnerability Index (2015) recommends establishing a multi-ministry technical climate resilience coordinating committee, including NGOs[86]. In 2017 the MoE developed the Strategic Programme for Climate Resilience (SPCR), to focus on three cross-cutting priorities to achieve climate change resilience: (a) technical capacity building and strengthening institutional coordination; (b) integrated land use and spatial planning; and (c) climate services and disaster risk management[87]. The SPCR is a key step towards ensuring inter-ministerial and multi-sectoral collaboration and integration of climate resilience considerations into development plans and actions. However, there remains a need to comprehensively implement the strategy and mainstream climate change adaptation at the sub-national level, engaging a diverse set of actors and sectors and empowering women to provide input into decision making at district and community levels.

Output 1.1: Landscape-wide land-use plan developed for climate-resilient livelihoods and forest ecosystems, integrating district strategies.

The GoR completed a National Land Use and Development Master Plan (NLUMP 2020) to guide land use planning and regulate permitting processes. However, effective and strategic land use has yet to be applied at a local and district level, and the conversion of plantation and riparian forests to agriculture continues and development projects are approved without sufficient knowledge of climate change risks or the value of existing forests for ecosystem-based adaptation (EbA)[88]. The Project will add climate-change resilience and adaptation content to central government efforts such as NLUMP and the SPCR process by acquiring, synthesizing, and disseminating key information on climate trends, the importance of remaining natural forests, and the value of ecosystem services. This information will also be shared at district and community levels through various outreach networks and workshops, with particular attention to reaching disadvantaged women, youth and vulnerable groups.

Building on the information base outlined above, the Project will work with the National Land Authority (NLA) to establish a working group, with participation from relevant ministries, agencies, and districts, including representatives of women, youth, and vulnerable groups interests, to develop a climate-resilient land-use

85 National Land Use Management Plan.

86 United Nations, 2015. Economic Commission for Africa; Rwanda Environment Management Authority. Baseline climate change vulnerability index for Rwanda. Kigali. Rwanda Environment Management Authority.

87 Rwanda's Green Fund (FONERWA), 2017. Strategic Programme for Climate Resilience (SPCR) Rwanda - December 2017. Link.

88 Scarano, F.R. et al, 2017. *Ecosystem-based adaptation to climate change: concept, sustainability and a role for conservation science,* Perspectives in Ecology & Conservation 15(2), 65-73.

plan for the CND landscape. At the national level each relevant ministry and government agency will select and appoint a working group member while at the district level, participants will be selected from the Joint Action Development Forum (JADF). JADF is a multi-stakeholder platform meant to facilitate and promote the full participation of citizens in the decentralized and participatory governance and improve service provision processes with representatives from the public sector, private sector and civil society. The following stakeholders will form the basis of the collaboration: a) the Ministry of Environment represented by four of its agencies: the Rwanda Environment Management Authority (REMA); the National Land Authority (NLA), Rwanda Water Board (RBA) and the Rwanda Forest Authority (RFA); b) the Ministry of Agriculture, including the Rwanda Agriculture Board (RAB); c) the National Agriculture Export Board (NAEB) d) Ministry of Local Government; e) Rwanda Development Board (RDB); f) Gender Monitoring Office (GMO); g) Districts Decentralized Structures – the District Administrative Units, which supervise several technical and administrative activities; h) civil society, international organisations, academia and community based organizations. This list will be discussed during the inception period and expanded as necessary. From this, a spatial framework for district level land use planning will be developed that accounts for current and future climate risks, reconciles cross-sectoral land-use conflicts, and guides development decisions. All the activities and sub activities under this output will be executed by the Rwanda Forest Authority in collaboration with National Land Authority, and districts.

Activity 1.1.1. Synthesize and disseminate information on value of natural forests and ecosystem services

This activity will involve conducting a stakeholder mapping & consultation exercise in order to better understand the use of climate adaptation data in existing sectoral planning processes, and identify cross-sectoral linkages or conflicts. These results, along with a comprehensive literature review, will inform the design of high-level information packages that will synthesize information on climate risks for various sectors (e.g. agriculture, forestry) and highlight the value of forests for increasing resilience of local communities. An information dissemination program (e.g., presentations, workshops, and newsletters) will be implemented to share this knowledge among key ministries as well as government, non-government and community organisations. The Project will use JADF as a platform to disseminate information to key stakeholders. Particular attention will be paid to ensure women, vulnerable and youth groups from Ubudehe categories c, d and e are represented . In addition, the program will use mass media in the form of a radio program and complementary community action campaigns to improve community, women, youth, other vulnerable groups knowledge on climate information, climate risks and climate adaptation options. This will stimulate discussion on issues pertaining to climate risks and other social issues locally and support engagement of each in responding effectively to climate adaptation and resilience options.

Cross-sectoral tradeoffs and climate adaptation solutions with cross-sectoral implications will also be highlighted, in order to begin promoting the benefits of integrated land-use planning. To complement the high-level information dissemination program, a suite of technical training materials will also be developed for delivery to district technical staff. These materials will provide training on climate risks & the need to incorporate climate adaptation into land-use planning, with a focus on the technical skills required for climate-sensitive planning (e.g. sourcing climate data, mapping ecosystem services).

Sub-activities will include:

1.1.1.1 Map the sectors involved in land-use planning in the CND and review how forest ecosystem services and climate resilience are incorporated into each sector's planning process

1.1.1.2 Conduct comprehensive literature review & stakeholder consultation to collect & synthesize information on climate risks for various sectors (e.g. agriculture, forestry), the value of forests for increasing resilience of local communities, and highlight adaptation solutions with cross-sectoral implications.

1.1.1.3 Host workshops & presentations with key ministries, government organizations, NGOs and community organizations to disseminate high-level knowledge on value of forests for increasing resilience of local communities.

1.1.1.4 Develop guidelines for integrating climate risk into land use planning and cross sectoral planning

1.1.1.5 Develop outreach materials on climate and related risks in the CND and the value of forest ecosystems for increasing resilience

1.1.1.6 Implement outreach program tailored to different stakeholders (local government, civil society, communities, women, youth) to enhance capacities for land-use planning, funding mobilization, and delivery of climate adaptation actions

1.1.1.7 Conduct climate literacy seminars for local government and civil society organizations, aimed at increasing women and youth participation.

1.1.1.8 Provide financial and logistical support to trained organizations in grassroots mobilization to increase women and youth participation in climate adaptation planning.

1.1.1.9 Introduce social safeguards at a high level at each meeting, including the GRM, FPIC, and Access Restrictions Mitigations as safeguards to be in place for work with local communities.

Activity 1.1.2. Develop climate-resilient landscape land-use plan

This activity aims to ensure that climate change adaptation requirements are fully integrated into planning processes at local, district and national scales. This will involve i) participatory scenario analysis to understand the problems local communities and district officials face in terms of natural disasters (flooding, soil erosion, forest loss/degradation) and climate change, as well as the future land use plans of the districts, including an assessment of the national consequences of these problems in terms of ecosystem service delivery and climate change resilience and adaptation capacity; ii) risk assessment to estimate the impacts of the planned land use changes, as well as climate change, on flood risk, soil erosion, forest loss/degradation and the well-being of local people, especially any disproportionate impacts on women, youth and vulnerable groups; iii) climate change adaptation and mitigation measures development to decide possible climate actions for both adaptation and mitigation and prioritize these actions according to their feasibility and urgency in consultation with local communities, district leaders, and other stakeholders; and iv) land use plan development based on the recommendations from the previous 3 steps. A comprehensive consultation and feedback process will be undertaken to incorporate views of stakeholders at all levels (e.g. civil society; men, women, youth, and historically marginalized people in local communities; district & national government), upon which the plan will be finalized and approved by the Government of Rwanda.

Sub activities will include:

1.1.2.1 Engage district officials, Joint Action Development Forums (JADF), and community members in the CND (especially women) in reviewing and interpreting the National Land Use and Development Management Plan (NLUMP), to ensure the plan accounts for current and future climate and related risks, while building local support for climate sensitive planning

1.1.2.2 Conduct participatory land-use planning process in communities from village to district level to support integrated climate resilient land use planning

1.1.2.3 Develop Integrated Land-use Plan that supports Resilient Livelihoods and Ecosystems in the CND, ensuring alignment with National Land Use and Development Master Plan and ensuring the CND plan guides the district plan

1.1.2.4 Develop and roll out a series of trainings (virtual sessions and online modules) on gender sensitivity and mainstreaming women and youth into planning

1.1.2.5 Assess specific climate impacts on historically marginalized and Category c,d,e populations through a participatory NR process to ensure the Project components address their needs for adaptation

Output 1.2 Local and national institutional capacities strengthened to integrate biodiversity and climate risks into land use planning and management

Forest data in Rwanda has historically been generated in an ad-hoc fashion[89] through the support of external agencies. This precludes comprehensive consideration of forest and biodiversity data in land-use planning processes. As Rwanda moves to achieve the goals outlined in the Green Growth and Climate Resilience Strategy and the National Land-Use Development Master Plan, building governmental capacity in generating and utilizing spatial data to inform decision making is essential. The activities under this output will involve recruiting experts in mapping, remote sensing and ecosystem service modeling, in order to establish a formal spatial planning unit within government. These experts will also lead a formal information dissemination and capacity building program, in order to i) promote the importance of considering forest & climate resilience into land-use planning, and ii) deliver detailed training to technical staff on forest mapping, climate and ecosystem service modeling. The Project will also increase the understanding of the importance of forest landscape restoration in securing ecosystem services for local economic development and resilient livelihoods. It will ensure that the public, decision-makers and other stakeholders in the CND landscape have a high level of awareness of the risks to the economy and livelihoods associated with deforestation under current and possible evolution of these risks with the changing climate, and the benefits of reforestation in an integrated landscape approach.

Women's land rights need some key consideration for an effective integration of women in land use planning and management, among which include advocacy for women's knowledge of their rights, women's confidence in the dispute resolution process and outcomes, men's respect of women's rights, and modest improvements in physical and social accessibility of the local justice system for women are most critical avenues for success. These factors will be considered throughout project implementation of the activities proposed within this project using a gender-responsive, participatory and fully transparent approach. For example, under the project trained institutions will hold meetings to train women, youth and marginalized people on forests and mobilize them to participate in planning processes and local institutions will be trained to build capacity of rural people, specifically women and youth, to participate in climate adaptation processes Program Staff and government officials will be trained understand gender barriers, understand how to mainstream gender equality principles into planning and support women, youth and marginalized participation in meetings.

Furthermore, the Project will support dialogue with the private sector and planning processes needed to mainstream climate change and biodiversity in the tea sector. Projected climate changes predict significant elevation rises in CND agro ecological zones, including the potential for tea cultivation at much higher

89 Arakwiye, B., et al, 2021. *Thirty years of forest-cover change in Western Rwanda during periods of wars and environmental policy shifts.* Regional Environmental Change 21(2).

elevations than at present. This is unlikely to threaten Rwanda's existing montane forest parks, as foreign revenues from tourism in these reserves far surpass those from tea. However, tea remains a significant source of foreign revenue and a government target for expansion. Any increased tea production in the CND would therefore most likely affect lands outside of parks: smallholder, cooperative, and district holdings, many of which might also be targets for reforestation, agroforestry, and biodiversity stepping stone initiatives under this Project. The integrated land use planning included in this Project design, will bring together tea industry, agriculture, forestry, biodiversity, and tourism interests to identify and reduce such potential conflicts over use of the CND's limited land resource base. Through this integrated land use planning we aim to establish a formal public-private sector forum at the landscape level to help improve communication across sectors, appreciation of environmental issues, and increase synergies between interventions to avoid conflicting targets and indicators between sectors.

This output will comprise the following activities and sub activities which will be executed by the Rwanda Forestry Agency (RFA) in collaboration with key government agencies, private sector and civil society organizations.

Activity 1.2.1 Create interagency taskforce institutionalizing integrated landscape planning and policy

Insufficient mechanisms for integrated land use planning constitute one of the key barriers for sustainable natural management in Rwanda. Planning processes within government agencies are carried out in silos without paying attention to the impacts a certain land use activity or project will have on other sectors of the economy. This Project aims to facilitate improved collaboration among government agencies by strengthening the government's existing cross-sectoral planning task force. The existing task force was set up to support cross-sectoral implementation of the National Strategy for Economic Transformation, but it suffers a number of weaknesses, including: i) a lack of official mandate for the task force to carry out activities; ii) irregular attendance of members; and iii) lack of clear and regular funding to facilitate meetings. This activity will review the mandate and structure of the cross-sectoral task force and promote solutions for strengthening its operation to RFA (the task force coordinator). It will also facilitate quarterly meetings of the task-force, in particular between institutions in charge of agriculture and agroforestry, to encourage synergies and avoid overlapping mandates and redundancy in different climate resilience interventions. The involved staff at both national and local levels shall be empowered to readily share information and activity plans, and will be offered technical support to generate materials that can inform decision-making (e.g. policy briefs, map, presentations). The Project will support collaborative integrated landscape planning, which secures climate resilience undertaken with appropriate social safeguards.

Sub activities will include:

1.2.1.1 Review & strengthen operationalisation of the current cross-sectoral task force

1.2.1.2 Hold quarterly sectoral planning meetings with both national and district administrations in CND and the private sector involved in mining, agriculture, and livestock production in the landscape

1.2.1.3 Facilitate discussions and provide technical support (e.g. policy briefs) in decision-making for cross-sectoral actions around climate adaptation and forest resilience in the CND

1.2.1.4 Continue to introduce social safeguards at each meeting including the GRM, FPIC, and Access Restrictions Mitigations as safeguards to be in place for work with local communities. For those at the district or community level, provide options for feedback on the process and best ways of communication with local partners.

Activity 1.2.2 Build capacity for spatial planning in national agencies re climate change

Spatial planning is emerging as a valuable tool for the development of evidence-based land use and climate resilience strategies[90]. This subcomponent will develop capacity within the Rwanda's university network and the MoE to use remote sensing, ecosystem service modeling and spatial planning tools (e.g., Marxan, InVEST, RIOS, SWAT and other open access tools such as Open Foris) to incorporate climate risks and climate resilience strategies into development plans and to readily identify and reconcile land use conflicts. A prime example of the latter is the potential for climate-driven shifts in optimal elevation zones for coffee and tea cultivation conflicting with current subsistence agriculture in the case of coffee, and key remaining natural forest fragments with regard to any upward migration of tea. These spatial planning tools will be procured by the project and will be made available to the spatial planning unit.

The Project will assist the GoR in developing a dedicated spatial planning unit (SPU) within an appropriate ministry or cross-cutting agency. The appropriate hosting institution will be determined during the project implementation in consultation with key government agencies operating under the Ministry of Environment. This will include support for training high level Rwandan specialists to provide the technical expertise needed to process and integrate spatial planning into decision-making within and across sectors. A specific contribution of this SPU in coordination with appropriate governmental and non-governmental partners is the development and operationalization of an innovative, scientifically credible, scalable system for monitoring trends in natural forest cover and forest types at multiple scales. This SPU will also allow Rwanda to measure and report on the land use, land use change and forestry (LULUCF) sector as part of a national Greenhouse Gas Inventory (GHG-I). This system will build on the national FMES that was established with the support from ENABEL.

Capacity building is essential for execution of the Project; even more so for the sustainability of Project elements in the long run. To improve Rwanda's collective ability to integrate land use planning in support of climate change resilience and delivery of ecosystem services, these sub-activities are planned:

1.2.2.1 Recruit spatial planning expert/s to support spatial planning unit

1.2.2.2 Assess and identify the institutional home and operationalize the spatial planning unit

1.2.2.3 Conduct a capacity needs assessment and identify the appropriate tools for spatial planning to fit the Rwandan context and conduct familiarization

1.2.2.4 Led by the spatial planning unit, develop capacity within the University of Rwanda and the MoE to use remote sensing, ecosystem service modeling and spatial planning tools (e.g., Marxan, InVEST, RIOS, SWAT) to incorporate climate risks into land use planning processes

1.2.2.5 Deliver training workshops on utilization of earth system models for land use planning purposes, utilization of remote sensing resources (lightning, satellite radiances) for hazards detection and climate monitoring and on regional climate monitoring and applications.

Activity 1.2.3 Develop an effective forest monitoring system to underpin forest management decisions

90 Mathias S., et al, 2019. The Spatial Development Framework to facilitate urban management in countries with weak planning systems, International Planning Studies, 24:3-4, 235-254, DOI: 10.1080/13563475.2019.1658571

Within Rwanda, forest-related data is limited in scope and generally outdated[91]. Consequently, the current state and trends of Rwanda's forests are not well understood. Efforts to improve the situation through individual studies have been valuable but have not led to systematic increases in spatial information on trends in different forest cover types and resilience at the scales at which land use decisions are being made. For example, the FMES software focuses on forestry and plantation forests, but does not address natural forests. This activity will update and monitor forest cover data in different ecological zones and forest types using high resolution satellite imagery, field work, and remote sensing techniques. In addition to remote sensing techniques, the Project team, once selected, will meet with government and international partners to assess best monitoring tools and platforms, including Open Foris. Close attention will also be given to the system used by Mugabowindekwe et al (2023)[92] for the most recent, highly detailed forest inventory from 2007 imagery. RFA will recruit a Rwandan expert who will work with WCS experts in applying spatial planning and forest monitoring tools in support of government agencies during the project implementation to strengthen the capacities of RFA, NLA and GIS Center at the University of Rwanda.

An adaptive forest, climate change and land use monitoring system will be established to support climate resilient forest management decisions through the following:

1.2.3.1 Recruit Forest ecologist or remote sensing expert to support the design and implementation of indigenous forest monitoring system

1.2.3.2 Review existing forest mapping data and monitoring software, and assess utility for generating quantitative assessments of indigenous forest cover from local to national scales

1.2.3.3 In collaboration with REMA, MINAGRI, RAB, RDB, RISA, MoE and affiliated agencies and University of Rwanda, design structure and operation of forest monitoring system, including required inputs (data, computing, personnel), desired outputs, and operational structure (e.g. location, reporting structure, funding)

1.2.3.4 Purchase and install 2 new weather automatic stations in the CND

1.2.3.5 Establish & operationalize forest monitoring system

1.2.3.6 Generate updated maps & statistics for indigenous forest cover, forest type etc. using forest monitoring system

1.2.3.7 Develop capacity within hosting institution for continued operation of forest monitoring system

Component 2: Forest and landscape management and restoration

The GoR has prioritized forest management and restoration – including natural forests in protected areas – as a key component of climate change adaptation strategies for the CND landscape.[93] Natural forests within the national park system have been generally well protected and managed in recent years, earning high marks for biodiversity conservation while also developing a high quality – and quite lucrative – set of ecotourism attractions. Current park management plans, however, include little attention to the potential effects of projected climate change. Outside of parks, few areas with natural forest cover remain and forest management and restoration approaches are not being implemented at the scale required to significantly improve forest climate resilience. Where forests are restored, most use exotic species and mono-specific

91 Food and Agriculture Organization of the United Nations, 2017. *Analysis of forests and climate change in Eastern Africa.* Forests and Climate Change Working Paper 16.

92 Mugabowindekwe, M., Brandt, M., Chave, J. *et al.* Nation-wide mapping of tree-level aboveground carbon stocks in Rwanda. *Nat. Clim. Chang.* **13**, 91–97 (2023). https://doi.org/10.1038/s41558-022-01544-w

93 IUCN, 2014. *Forest landscape restoration opportunity assessment for Rwanda*. Link.

plantations that are generally incompatible with mixed agricultural uses; they are also vulnerable to diseases and pests with climate warming.

In this component, targeted interventions will integrate climate change awareness and adaptation into national forest park planning, policies and management, as well as restore degraded areas within those parks. These efforts will help sustain the forests' rich biodiversity, the lucrative tourism revenues that flow into local and national economies, and the ecosystem services needed for climate resilience of vulnerable communities. This suite of activities will also identify priority areas outside of parks – in remnant natural stands, around wetlands, and along streams – for protection and restoration as "stepping stones" and linkages for long-term climate change connectivity.

Output 2.1 Protected Area management effectiveness improved re climate risks and adaptation

The remnant natural forests of the CND harbor globally significant biodiversity across multiple taxa, from primates to birds and orchids. More than 10% of these species are regionally endemic[94] – 47 flowering plants are endemic to Nyungwe Forest alone[95]. Though each has suffered from significant past habitat loss, the Nyungwe and Volcanoes National Parks have been generally well-managed under the Rwanda Development Board (RDB), with assistance from NGOs, PPPs, and the private sector. Rwanda's reputation for ecotourism and nature tourism attractions is world class. It has also earned conservation recognition for the dramatic recovery of its endangered mountain gorillas, sustained protection of its remaining biodiversity, and creation of a significant revenue-sharing program with parks-adjacent communities. The recent addition of Gishwati-Mukura National Park to this mountain forest network underscores the government's commitment to conservation, though both forest blocks require significant restoration for the purposes of biodiversity conservation, connectivity, and ecosystem services enhancement.

In contrast to Rwanda's areas of conservation success, relatively little attention – and less action – has been focused on climate change and its potential impacts on habitats and biodiversity, especially in the climate-adapted mountain forests of the CND. The investment required to build and sustain the institutional and human capacity to achieve Rwanda's recent conservation success now needs to be joined with a parallel investment to ensure that PA management plans, policies, and actions address the realities of climate change both within and outside of their boundaries.

Activity 2.1.1 Facilitate revision of PA management plans to address climate risks

Climate change is increasingly recognized as not only a major future threat to protected areas, but one that will also exacerbate existing threats and vulnerabilities[96]. This is particularly true for the three national parks of the Congo Nile Divide landscape that are surrounded by a large number of smallholder farmers who are dependent on natural resources for their livelihoods. The park planning processes need to be expanded to best meet challenges posed by climate change as well as ensure full incorporation of buffer zone and landscape linkage requirements, and the ability to engage with the larger CND and district landscape management planning processes. The revised management plans will aim to:

- Develop specific goals and objectives for improving climate resilience
- Identify areas and species of particular importance to climate adaptation, mitigation and resilience
- Identify and prioritize threats that exacerbate climate impacts
- Identify and prioritize critical actions for strengthening resilience

94 CBD. 2020. Rwanda 6th National Report to the Convention on Biodiversity

95 Fischer, E. and Killmann, D., 2008. *Illustrated field guide to the plants of Nyungwe National Park Rwanda*. University of Koblenz-Landau.

96 World Bank, 2019. *Rwanda Systematic Country Diagnostic.*

- Identify areas important for climate change adaptation and mitigation into protected area zones and regulations
- Develop indicators of climate resilience

To this end, the Project will undertake these sub-activities:

2.1.1.1 Review and update existing national park management plans to ensure climate and related landscape changes, risks, impacts and required management responses are integrated

2.1.1.2 Provide technical and financial support to planning, research and monitoring as well as community-based conservation units within RDB in managing the parks as part of larger CND landscapes

2.1.1.3 Train PA staff to integrate gender and social inclusion into programming

2.1.1.4 Train PA staff on integrating needs of women, youth, historically marginalized and Ubudehe Categories c,d,e populations into climate adaptation risks and responses

2.1.1.5 Train PA staff on SEAH, GRM, FPIC, and Access Restriction Mitigation Processes to ensure NP climate change responses are undertaken in a way which supports social inclusion and equity

Activity 2.1.2 Establish long-term plans for CND financial sustainability post-GCF

Rwanda has recently developed a Biodiversity Finance Plan[97] through support from BIOFIN. This plan has identified a number of financing solutions that will not only contribute towards improved biodiversity protection in Rwanda, but also aligns with Rwanda's sustainable development and green growth objectives. These solutions include:

- Introduce a Biodiversity Conservation Fund into Rwanda's National Fund for the Environment (FONERWA) to help streamline and attract domestic and international sources of finance to support conservation investments and thereby reduce transaction costs to increase conservation benefits.
- Improve efficiency and effectiveness of environmental fees and fines to strengthen the effectiveness of the regulatory environment that will ultimately improve ecosystem and biodiversity conservation goals.
- Water User Fees for Catchment Management to secure the financial resources necessary for effective water catchment management.
- Pilot Business Plans for Selected Wetlands to enable the sustainable development of wetlands for ecotourism and biodiversity-friendly enterprises such as handicrafts, fisheries, and sustainable agriculture.
- Promote biodiversity-friendly enterprises in the transition to a green economy and accelerate the transition to a green economy by incentivizing and supporting businesses to adopt sustainable practices and attracting investments in new conservation enterprises.
- Strengthen the tourism revenue sharing scheme to improve biodiversity outcomes and effectively address conservation-development objectives
- Develop a Protected Area Finance Strategy to support the goal of increasing the financial and ecological sustainability of Rwanda's Protected Area System (PAS)

There are also new emerging solutions such as the Wildlife Conservation Bond (WCB) which essentially is a payment for performance-based financial instrument that channels investments to achieve conservation outcomes – measured in this case by specific conservation targets that could be set (e.g., hectares of native forest restored, or an increase in umbrella species populations). In the case of Rwanda, gorillas and

97 BIOFIN Rwanda – Biodiversity Finance Plan, REMA, 2019.

chimpanzees are considered umbrella species that play a crucial role in shaping entire ecosystems on which countless other species depend. For the WCB, a grants-based, outcome payer is needed, which could be the GCF. Through the WCB, and in collaboration with the World Bank (WB), the WB could issue bonds and investors could support the financing of activities to protect and grow a critically endangered species with clear conservation targets, contributing directly to biodiversity and bringing jobs to local communities through the creation of conservation-related employment in rural areas of the CND. A third-party, independent verifier is also needed to evaluate whether conservation targets have been met. A meeting is planned with the WB in the second half of February 2023 in Rwanda to determine the scale and feasibility of the WCB in the CND. The South African Rhino Bond has already attracted foreign investment, and it is a good model Rwanda could emulate[98]. The Government of Rwanda, represented by the Rwanda Development Board, is in advanced stages of negotiation with the World Bank for establishing a wildlife Bond. There is, therefore, clear interest in the bond which suggests that investors still see value in investing in such an instrument.

A technical advisor will be recruited by this project to provide technical support to RDB, REMA, MINECOFIN and MoE and explore these various solutions to identify financial instruments that could be employed for revenue generation post-GCF for sustainable management of the CND landscape. The technical advisor will work closely with the NSC to facilitate buy-in from stakeholders such as RDB and MINECOFIN into compliance with environmental laws through greater emphasis on the links to climate resilience and NDC objectives.

Activity 2.1.3 New fire management curriculum developed and operationalized Given the expected increase in drought, and the natural forest vulnerability already demonstrated in the past, the capacity for effective fire prevention and management in core PAs and adjacent landscapes will be increased.

While current climate projections call for increased rainfall in the CND, they also project higher temperatures and a rise in elevation of the natural forests' cloud cover zone (Annex 2.1). The combination of the latter two trends raises the potential for increased fire risk. In order to sustainably address the threat of fire to the natural forests and regenerated areas in particular, this project will increase the capacity of RDB in the area of fire prevention, with emphasis on education and outreach, monitoring of fire danger conditions across the parks, response plans, and fire suppression. A collaborative effort in fire management planning and implementation in CND districts will be carried out, facilitated by a fire management expert. Based on training needs, the project will also carry out RFA district and sector foresters' training in Integrated Forest Fire Management approaches and activities and firefighting; they will then build the capacity of community fire brigades.

Sub-activities include:

2.1.3.1 Develop a curriculum tailored to needs and capacities of different stakeholders

2.1.3.2 Build the capacity of RDB to manage fire in National Parks

2.1.3.3 Build the capacity of RFA, local authorities and communities to collaboratively manage fire in forests outside Pas

2.1.3.4 Implement a "fire wise" outreach and awareness program for communities and local government (district, sector, cell), as well as Rwanda Forest Authority, surrounding natural forests to reduce the incidence of human-caused fires.

98 World Bank, 2022. *Wildlife Conservation Bond Boosts South Africa's Efforts to Protect Black Rhinos and Support Local Communities.* Press Release NO: 2022/059/AFE.

Output 2.2: Natural Forest cover restored, biodiversity connections established.

The natural forests of the CND exist as an archipelago of isolated islands within a surrounding matrix of intensive human land use. Although some have raised the possibility of reconnecting these islands, it is important to understand that their isolation is not a recent phenomenon (with evidence of the initial isolation of the main forest blocks from the pre-colonial era). Furthermore, large-scale proposals for landscape linkages have thus far failed to provide alternatives for the tens of thousands of rural smallholders who would be displaced by such schemes. However, important actions can be taken to restore degraded natural forest lands and protect or reestablish natural "stepping stones" and ensure a functional level of ecological linkage between the existing parks.

In some areas where natural forests have been cleared, the Project will work to restore forest cover. This will be done primarily around the Gishwati and Mukura reserves, using native species and building on nursery and planting techniques already tested in Rwanda. New techniques may need to be developed to expand reforestation to degraded lands on steep slopes and along waterways and wetlands. Tree species will be carefully selected considering the following attributes: pioneer species which grow in full sun, fast growing (height and canopy width), and animal pollinated and dispersed. These "tree islands" serve several purposes. First, by growing quickly and providing canopy cover, they shade out competing vegetation and change the soil microclimate (very important for later successional species establishment). Site-generalist native species such as *Albizia, Dombeya, Macaranga and Polyscias* respond to these characteristics. Secondly, they entice a variety of animal species into the expansion area, thereby dispersing seeds. In certain areas the Project will favor natural regeneration from seed banks.

All work outside of protected areas will require careful attention to private land ownership claims and related social and gender equity issues. Part of the communities' responsibilities will be afforestation of the degraded forest with indigenous trees and clearing invasive species from the natural forests and buffer zones. Part of the benefits for the communities will be harvesting of non-timber forest products (NTFPs) from the natural forests, under sustainable use plans. The project will provide training on improved harvesting techniques, processing, packaging and marketing, to those engaged in NTFP value chain (financed under outcome 3).

Activities and sub activities under this output will be executed by the Rwanda Forestry Authority (RFA) with the technical support from WCS.

Activity 2.2.1 Secure key remaining natural areas outside PAs

Outside of current protected areas, the Project will identify remaining natural areas and seek to secure their continued protection within district management plans or through other means. These are mostly small stands of natural vegetation on rocky outcroppings or strips of forests along the CND's myriad of waterways. Although these will not permit large mammals (e.g. elephants or mountain gorillas) to migrate between the forested parks, these small remaining natural areas provide critical intermediate stepping stones for the broader biodiversity elements of the CND forest ecosystems. For the CND's rich assemblage of bird species, these vegetated patches and gallery groves could prove to be essential stepping stones for connectivity under changing conditions. Small mammals and insects are likely to also directly benefit. And most importantly, the movement of birds and small mammals will support the transfer of seeds between forest patches, greatly improving the ability of forest ecosystems to adapt to changing climates, and continue supplying key ecosystem services to the people of the CND.

Sub-activities include:

2.2.1.1 Raise awareness on remaining protected natural forests in CNDL to secure their protection

2.2.1.2 In collaboration with RFA, REMA, districts identify and implement actions that support conservation and management of remnant protected natural forests in CNDL

Activity 2.2.2 Restore natural forest cover in and outside Protected Areas including riparian linkages

While the boundary integrity of the Nyungwe and Volcanoes NPs has been maintained for several decades now, internal degradation has occurred. Prior to 2004, approximately 12% of Nyungwe National Park had been affected by wildfire, including a catastrophic fire during a period of prolonged drought in 1997.[99] The natural vegetation was quickly replaced by a carpet of invasive ferns. In recent years, teams of local community workers led by WCS have demonstrated that careful removal of the fern cover reveals still viable native tree seeds and seedlings that respond to this exposure by rapid growth and the formation of new forest stands. The project will expand this labor-intensive process of assisted regeneration to the remaining 4,500 ha of burned lands within the NNP, restoring forest values and generating significant employment for local rural communities.

For the Gishwati Forest, restoration with native species will take place on adjacent, previously cleared lands. This and other restoration efforts should benefit from tree nursery techniques and planting trials already initiated by RFA, RDB, and NGO partners around Nyungwe, Volcanoes, and Gishwati itself. The project will work with the National Tree Seed Centre to provide training on tree propagation and supply of quality seeds/seedlings/propagation materials, especially of indigenous species and plantation species not being sourced locally.

A special element within the CND landscape is its dense network of waterways. Historically forested riparian habitats along these streams and rivers, however, have been largely cleared of their forest cover. Riparian reforestation efforts will restore an important erosion control factor as well as recreate important biodiversity connectivity along linear corridors. RWB will co-finance these riparian restoration efforts. With support from district and sector leaders as well as community representatives, community members will be hired from neighboring villages to the project sites. The project will make efforts to recruit the most vulnerable community members in category c,d and e, women, young landless, and others to carry out these activities.

Key sub-activities include:

2.2.2.1 Review mapping of degraded natural forest areas in core NPs, stepping stones, and unprotected riparian lands using updated imagery and ground truthing

2.2.2.2 Identify parcels for restoration in core PAs, stepping stones, and riparian lands using desktop and field-based assessment

2.2.2.3 Establish indigenous tree seed nurseries in the CND to serve core PAs, stepping stones, riparian land restoration and promotion of indigenous trees on farms and in protective forests

2.2.2.4 Recruit, train (in forest restoration methods), and equip community workers to be involved in core PAs restoration and riparian linkages

2.2.2.5 Assisted rehabilitation of 4,500 ha of indigenous forest in NNP

2.2.2.6 Active restoration of natural forest on 500 ha Gishwati Mukura National Park

2.2.2.7 Restore 1,500 ha of riparian lands

99 Masozera, A.B., Mulindahabi, F., 2007. *Post-Fire Regeneration in Nyungwe National Park, Rwanda.* Wildlife Conservation Society.

2.2.2.8 Using permanent plots sampling, collect field monitoring data on tree species recruitment and growth for estimation of biomass, species richness, etc. in restored parcels in Nyungwe and Gishwati-Mukura National Parks as well as on riparian lands to assess success of initiatives, then replicate or adapt as needed

2.2.2.9 Perform Environmental and Social Screening on all positions being created by the project

2.2.2.10 Establish a grievance process for laborers

2.2.2.11 Update emergency and preparedness plan including risk mitigation guidance to local conditions at restoration sites

2.2.2.12 Train all workers on their rights and how to access the GRM

2.2.2.13 Provide code of conduct and emergency preparedness and safety training for all laborers

2.2.2.14 Hire and train labor and safety leads at each site to provide guidance to staff, be available for grievance issues, and monitor health and safety conditions for workers

2.2.2.15 Develop and implement strategy (including social marketing) to ensure that women and youth participate and benefit from forest restoration projects

Activity 2.2.3 Promote silvopastoralism with indigenous trees around Gishwati

Roughly 80% of Rwandans own livestock of some sort. While it is government policy to expand this percentage, conflicts over competing land uses are inevitable, especially for the country's most vulnerable rural populations. In the area around the protected forest of Gishwati, the presence of many slopes greater than 55% opens the possibility for reforestation of larger blocks with tree species compatible with an undergrowth of grass or other forage. In addition, some existing pasturelands could be enriched with tree species. These areas could then provide critical off-farm fodder for goats, sheep, and perhaps even cows, while also serving vital ecosystem services.

Plans for tree planting/restoration on pasture lands will be elaborated in collaboration with the local communities and technical (extension and local government) services. Areas meant to produce fodder and for water retention will be demarcated during community consultations for action plans. Already, important forage grasses, such as *Brachiaria* grass known to increase milk production while reducing methane emission from cattle, have been identified while tree fodder such as *Calliandra, Leucaena, Acacia, Gliricidia* are well accepted but not widely adopted due to local capacity barriers. Improving adoption of better management practices will require technical assistance considering needs of cattle owners, local milk cooperatives, and traders.

Beneficiaries of these activities will be pasture land owners and cattle keepers in the Gishwati area. They will be identified in collaboration with district and sector leaders, RFA, EE and representatives of pasture lands and cattle owners. Special attention will be paid to specific groups such as women-headed households, youth, and historically marginalized groups if they own grazing land in the Gishwati area and for paid work. Awareness and consultations with these pastoral communities will be conducted during project inception to ensure farmers' involvement in identifying and selecting key areas for restoration, suitable species to grow in their pastoral areas, capacity barriers, and associated technical assistance to be provided to adopt better management practices.

Key sub-activities include:

2.2.3.1 Assess the status of pasture lands in the Gishwati area and identify key areas for restoration and the potential to introduce indigenous species

2.2.3.2 In collaboration with landowners, identify suitable indigenous species for fodder trees, shrubs, grasses, and herbaceous legumes that have potential to improve rangelands and increase their climate adaptive capacity

2.2.3.3 Produce and disseminate fodder trees, shrubs, grasses, and herbaceous legumes to project beneficiaries

2.2.3.4 Train beneficiaries on improved livestock and pasture management

Component 3: Enhancing climate adaptation through resilient livelihoods

Increasing the extent of protective forests, enhancing and restoring forest plantations, and increasing agroforestry tree cover are key steps to restoring ecosystem function and services identified in the National Forest Policy Report (NFPR 2017), especially i) reducing the risk of flooding, landslides and soil erosion from extreme climate events and ii) increasing long-term supply of wood fuel resources (the primary energy source for 77% of Rwandans[100]). Together with fuel efficient cookstoves, these trees will provide a sustainable source of fuelwood and reduce the amount of time women spend collecting fuelwood, enabling them to participate in other economic activities and programmatic opportunities. These outputs (cookstoves, plantation restoration, and agroforestry) will deliver carbon sequestration benefits totaling 522,606 tCO_2eq over 20 years.

In working to develop a comprehensive land use plan that incorporates climate adaptation, and while ensuring Rwanda's forest ecosystems are strengthened through forest management and restoration, attention must be paid to people who live next to the forests and those who are the most prone to causing degradation of these forest systems. In particular, this includes people who either do not have access to land or whose land holdings are insufficient to meet their daily needs. These people are most likely to enter into and unsustainably use protected and protective forests to help meet their daily needs. Thus, this Project component targets these vulnerable households – youth, people from historically marginalized groups, and farmers with insufficient holdings – to build their capacity in financial literacy and enterprise, in order to strengthen their resilience to economic and climate shocks.

Also, to maximize the opportunities from improved silvicultural practices, it is necessary to improve business practices and market linkages for farming communities. More specifically, organizing and linking farmers to local and national wholesale traders will enable them to sell their produce more efficiently, maximizing profit and reducing wastage. To facilitate these linkages, this component will also build the business capacity and market linkages necessary to support the transition of farmers and their communities away from unsustainable practices that magnify their vulnerability to climate change and towards more secure livelihoods and expanded income opportunities. This includes strengthening capacities, developing inclusive business models, and developing market value chains for livelihoods that do not depend on traditional smallholder farming.

The project will develop alternative sources of income to improve living conditions for people in the CND who depend for a large part of their income on exploitation of the forest and natural vegetation. This approach, focusing on vulnerable groups, aims at real economic empowerment of the concerned families through the realization of their own business plans. Several promising activities related to the use of the forests *aside* from wood-gathering (such as beekeeping, extraction of essential oils, herbs, and other forest

100 Government of Rwanda, 2021. *Rwanda Household Survey 2019/2020*. National Institute of Statistics of Rwanda.

products) will be analyzed. These business plans, tailored to individual circumstances, will be realized with support and tools provided by the project.

From the second year onwards, these vulnerable groups will become members of existing cooperative organizations that will be supported by the project, particularly in value chains important for forest conservation, such as production and export of honey and the extraction of essential oils. These cooperatives provide various services (e.g., information on markets / export, input supply, aggregation of commodities, etc.) and they also play a role in the protection of the interests of their members.

The project will develop the private sector strategy (which will include engagement of impact investors interested in conservation-friendly commodities) for livelihoods implementation in the target areas through the identification of new livelihood opportunities for the CND. We will establish relationships with several buyers fitting our selection criteria, and engage partners such as Blue Ventures to expand market opportunities for products that meet international or local market opportunities. On the producer side, we will build strong relationships with other projects and programmes that support private sector engagement with community organizations, and producer associations to pursue promising market opportunities (local and international, as appropriate).

For component 3 and the project overall, the eligibility criteria for selecting beneficiaries will be:

- Households with limited access to financial resources for implementing climate adaptation measures as determined by Local Authorities
- Women -headed households.
- Households in the CND living in key areas such as those surrounding PAs, identified stepping-stones, landscape linkages, and broader farming mosaic with exposure to erosion.
- Most vulnerable households including people with disabilities
- Land owners where the project intervention will have to intervene

These criteria will be further refined by the project EE in consultation with key stakeholders (MoE, Districts and community representatives) once the project is approved.

Output 3.1 Farming methods enhance productivity, reduce erosion and flooding risks, contribute to ecosystem services, and support connectivity

Soil degradation and loss, largely from the cultivation of steep slopes in the western highlands of the CND, has caused declines in agricultural productivity and serious downstream problems of siltation and flooding. While the former means that smallholder farmers in the hills increasingly struggle to feed their families, the latter poses a threat to the long term viability of water provision services in municipal areas and hydro-power generation[101], which is a key pillar for Rwanda's low carbon growth strategy.

This Project will support smallholder farmers in high erosion risk areas to implement Sustainable Land Management (SLM) practices techniques and the active *restoration* of degraded forest lands. By targeting high risk areas the Project can have a significant impact to reduce soil erosion, improving the resilience of agricultural livelihoods in the highlands, while having a positive impact on water flow and water quality in the lowlands.

101 Rwanda Environment Management Authority (REMA), 2009. *Rwanda State of Environment and Outlook Report, Chapter 8: Energy Resources.*

In each selected priority site, the Project will support the implementation of the full range soil erosion control best practices including agroforestry. While the erosion control practices may vary (e.g. radical vs progressive terracing), agroforestry practices will be established across the entire 3,346 ha. RFA will mobilize participating landowners on whose lands soil erosion control best practices including agroforestry shall be implemented. Landowners willing to participate will sign a consent form allowing project activities on their land and will be grouped in vigilance committees. These vigilance committees will sign MoU with Districts and RFA as a commitment to participate and manage sustainably their land and trees with clear role and responsibilities of each (farmers, districts and RFA) specified. The consent forms will be granted to RFA and Districts where landowners are located. The vigilance committee will be responsible for ensuring the sustainability of project interventions implemented on community land. The MoUs signed by Districts, RFA and the vigilance committee will not be legally binding but rather to establish certain understanding in the implementation of the project.

Interventions will be made in collaboration with district officials, according to agreed priorities and objectives, and involving local farmers and contractors. Table 29 in the feasibility study (FS) provides a preliminary list of the fuelwood, fodder, timber and fruit tree species that have been identified as suitable for agroforestry systems in the CND, based on their resilience capacity against climate-driven temperature and precipitation changes, as well as community preferences - particularly the needs of women farmers, historically marginalized households, and youth. They also concur well with recommended species for the North and Western Province as described in the Agroforestry Technical Guide[102].

Activity 3.1.1 Restore high slope areas (>55%) as protective forests

In Western Province, a major part of the CND landscape, 80% of the increase in tree-planting in recent years has come from private landowners seeking to earn revenue or increase their access to wood-based fuel[103]. Beyond this utilitarian interest, however, the NFPR 2017 calls for increasing the extent of protective forests and enhancing and restoring forest plantations as key steps to restoring ecosystem function and services, especially i) reducing the risk of flooding, landslides and soil erosion from extreme climate events and ii) increasing long-term supply of woodfuel resources (the energy source for 77% of Rwandans[104]), providing biodiversity habitat, and sequestering 193,472 t CO_2-eq over 20 years.

The current land use master plan discourages cultivation on slopes greater than 55% and encourages protection of existing vegetation and afforestation with indigenous species. This Project will promote indigenous species in rehabilitating existing forests and establishing new ones on bare lands. This activity will result in highly productive, climate-resilient woodlots and forestland with fully restored ecosystem services and significantly increased long-term carbon sequestration. It will afforest/restore 2,500 ha of degraded private smallholder land and district/state land by restoring existing degraded tree stock, afforesting bare areas, promoting good silvicultural practices, and facilitating the adoption of Simplified Forest Management Plans (SFMPs), as recommended by 2013 forest law. In the priority regions selected for afforestation/restoration, awareness and capacity building activities will be undertaken to build support and understanding of the PFMU approach. The objective of PFMUs is to combine economic profitability, preservation of environment, and improvement of living conditions of the local population, as well as to apply a gender-responsive approach to wood resource management. For privately owned land, only small-scale individual private landowners will be included, and this activity will not involve restoration of private institutional plantations. RFA will mobilize participating private landowners on whose lands afforestation

102 Ministry of Environment. 2018. National Agroforestry Strategy.

103 Arakwiye, B., et al, 2021. *Thirty years of forest-cover change in Western Rwanda during periods of wars and environmental policy shifts.* Regional Environmental Change 21(2).

104 Government of Rwanda, 2021. Rwanda Household Survey 2019/2020. National Institute of Statistics of Rwanda.

trees shall be planted. Landowners willing to participate will sign a consent form allowing project activities on their land. Following this, private woodlot owners will then be organized into local groups (around 40-50 ha of woodlot per group), PFMUs (Private Forest Management Units) and assisted to form and register as cooperatives and elect among themselves two cooperative committees: Administrative committee made of 5 persons (President, Vice president, Secretary and two Advisors); supervisory committee made of 3 persons (President, vice president and secretary). Note that gender consideration is mandatory (at least 30% women).

When the cooperative committees are elected, they are mandated to represent forest landowners at different events and fulfill their interests, especially in seeking the best market for their forest products and seeking for other income generating opportunities. RFA will sign MOUs with different cooperatives specifying each party's respective role and responsibility.

Experiences from pilot PFMUs established under the FMBE project in the districts of Gicumbi, Gakenke and Rulindo Districts of the Northern Province and Rwamagana District of the Eastern province have demonstrated that this approach is helping to achieve economic profitability, preservation of environment and improvement of living conditions of the PFMU members. Forests are sustainably managed, and all PFMU members respect the management plan and planned harvesting period. All silvicultural practices are properly followed because cooperatives supervise all activities with technical guidance from the district technicians. The forests within a PFMU are economically attractive to potential buyers due to good stock at harvesting time. PFMU members have access to small loans while waiting for the forest to mature. This shows that PFMUs established in these areas are also serving as demonstrations to other forest owners supported by other projects in the country. Green AMAYAGA and Green Gicumbi, and TREPA Projects are scaling up this approach in other parts of the country.

On public land, forests will be organized into state/district FMUs to be managed by professional private companies through long-term concession agreements in line with the government strategy. While a concession agreement will be signed between the private forest companies and the MoE, the Project will only support the design of the forest management plans and development of contracting documents. Registration of restored forest parcels will be guided by well-trained district forest officers and forestry sector extensionists, assisted by the new FMES software and related GPS/tablets, which will provide automatic statistics, maps and register owners. For each FMU, a SFMP, reviewed or developed through a participatory process, will outline the basic information of the site (e.g. owner, species etc.), as well as a harvesting plan and schedule for silvicultural operations (thinning, pruning etc.). However, some areas of the state plantations that are vulnerable and exposed to high risk of degradation (high slopes) will require setting up special protective measures. Restoration on identified vulnerable areas will be done by establishing appropriate tree plantations that will offer a better protection and conservation of biodiversity while providing other ecosystem services including tree species that improve forage for bees. The choice of tree species planted will take into consideration women's participation, use and priorities. The project will further strive and advocate for gender equity for selection of plots which will be done in consultation with communities.

Sub-activities include:

3.1.1.1 Introduce and raise awareness of indigenous species to target stakeholders in CND

3.1.1.2 In consultation with RFA, National Land Authority, districts and communities, determine fragile areas (steep slopes > 55%) to be allocated for protective forests and their ownership

3.1.1.3 Assess the current status of the indigenous tree species in selected areas for protective forests and select indigenous tree species appropriate to CNDL

3.1.1.4 Develop restoration plan for protective forests

3.1.1.5 Build capacity of local stakeholders (men and women) on PFMU approach and methods

3.1.1.6 Design and approve SFMPs of private FMUs

3.1.1.7 Ensure consent of smallholders prior to planting trees

3.1.1.8 In collaboration with smallholders reforest/restore 2,500 ha of public or private land with slopes >55% and ensure sustainable management under private FMUs according to approved SFMPs

3.1.1.9 Support monitoring and evaluation of restored private FMUs

3.1.1.10 Assess impacts of exotics on neighboring lands and mitigate their negative impacts

3.1.1.11 Develop and implement strategy (including social marketing) to ensure that women and youth participate and benefit from forest restoration projects

3.1.1.12 Assess the benefits and costs of each proposed tree and plant species and how those benefits affect different population segments

Activity 3.1.2 Develop on-farm agroforestry for high-caloric and indigenous tree species

The extreme land scarcity of the CND precludes smallholder farmers – many of them among the most vulnerable and land-poor of the region – from dedicating any significant proportion of their holdings to tree production. However, the use of certain agroforestry species that both enrich the soil and control erosion when interplanted with ground crops can greatly reduce this conflict.

Under this activity, the Project will facilitate the production of on-farm afforestation plans with action plans for implementation. Formulation of the forest landscape restoration plans will follow the methodology introduced by the World Resources Institute (WRI) and IUCN and already tested in the country by the former Ministry of Natural Resources, as recently modified and applied for the Gatsibo Forest Landscape Restoration baseline conditions assessment. The methodology will involve three simple steps: a) Geospatial analysis to map degraded land that presents an opportunity for forest and landscape restoration (FLR), which will highlight areas with best potential for restoration; b) economic analysis to model the costs and benefits of degraded and restored land); and c) designing a restoration/afforestation action plan, based on an in-depth assessment of the conditions required to implement the FLR in the selected sectors.

For selected areas where Project activities may lead to reduced access to resources, the Project will undertake an in-depth Environmental and Social Impact Assessment (ESIA) in the first year of implementation and design an Environmental and Social Management Plan (ESMP) to guide implementation. This ESMP will include an access restriction mitigation plan, if deemed necessary. The matter of Free, Prior and Informed Consent (FPIC) will be explored during the ESIA and the approach applied if deemed appropriate. These documents will be based on materials contained in Annex 6.

Drawing on experience with high-elevation species identified both in Rwanda and across East Africa, the Project will support the following sub-activities:

3.1.2.1 Identify sub-areas of intervention for agroforestry dissemination in the CND

3.1.2.2 Introduce and raise awareness of agroforestry in target communities

3.1.2.3 Develop the capacity of extension agents at district/sector level and NGOs to support adoption of agroforestry technologies

3.1.2.4 Establish agroforestry/fruit tree nurseries to facilitate access to quality planting material

3.1.2.5 Promote sustainable land management practices by stabilizing existing terraces, and plant high calorific agroforestry species to provide a sustainable source of fuelwood for energy-efficient cookstoves to protect sloping land against severe soil erosion.

3.1.2.6 Train RFA, extension agents, Project participants and community members on specific techniques for identification of and management of invasive pests and pathogens

Participants in sub-activities 3.1.2.3 and 3.1.2.6 will be selected by districts, JADF, RFA and farmers representatives. Special attention will be given to youth, women and other vulnerable groups. RFA and RWB will co-finance bub-activities 3.1.2.4 and 3.1.2.5.

Output 3.2 Rural livelihoods generate alternative incomes & reduce pressure on forests

To respond to the growing pressure on natural resources and increase the local community's resilience to climate change in the CND landscape, the Project will address key drivers of deforestation by creating alternative livelihood pathways for youth and women through ecotourism and income-generating, climate-resilient crops, as well as strengthening supportive financial services.

The setup of interventions in this output will focus on enhancing on-farm production capacities in market-facing promising value chains in agroforestry (especially avocado, macadamia and short-duration crops) for immediate income and beekeeping taking advantage of the agroforestry and the crops; the combination of these will promote ecotourism as supplementary income (avocado, macadamia, forestry, agroforestry, short-term crops, and honey). This output will also provide solutions to the growing households' energy poverty which has exerted pressure on natural resources and eventually exacerbated the local community's exposure to the stress of climate change in the CND landscape.

This project will employ a market systems development approach that encompasses business coaching, value chain development, and access to finance. This entails multi-stakeholder collaboration with business service providers, financial institutions, community-based enterprises, value chain actors, and farmer cooperatives. Ultimately, this project will develop and or promote a financial model that enhances the private sector ecosystem collaboration and partnership to stimulate finance in forestry and agroforestry sectors and support market-oriented access to energy-efficient cook-stoves to reduce pressure on forests.

The value chain development for potential revenue generating streams such as honey, ecotourism, and efficient cookstoves requires grant support of GCF grant to finance the activities that are important for the most vulnerable, as well the drivers for the MSD to take root; these include the development of the identified revenue generating streams, strengthening access to market information, and improving quality of the products and produce aggregation.

To target the poorest and most vulnerable, and empower women and youth towards meeting inclusive development goals, critical support at the nascent stages is essential. The GCF grant will facilitate the integration of the poorest and most vulnerable women and youth in the CND and position for private sector investments that will build a firm back base for sustainable community development. The GCF grant will not only provide financing support but will be critical in creating enabling opportunities for market development beyond the project to catalyze private investments.

While promoting the above-mentioned households cooking solutions and income streams, the selection of the beneficiaries will follow the government' procedures, and in the case of CND will focus on the vulnerable groups of youth, women, and historically marginalized people and will be selected based on an assessment

of poverty levels (also known as Wealth Categories) conducted by the government to ensure the most vulnerable are selected. Selection criteria will further take into account social and cultural factors such as gender and age which intersect to predispose some groups more to vulnerability than others.

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Activities and sub activities under this output will be executed by the Rwanda Forestry Authority (RFA) with the technical support from CORDAID.

Activity 3.2.1 Develop agroforestry related value chain for markets access.

Most traditional tree farming in Rwanda is linked to fuel production in terms of firewood, charcoal, and timber for construction. However, to further strengthen community resilience to climate change, there is a need to introduce fruit and nut trees that have high economic value in the agroforestry system to generate more income for smallholder farmers but also increase its adoption, especially women-headed households. Though women-headed households face the same issues and challenges as male-headed households, they are less likely to be included in income-generating activities and are disproportionately impacted by climate change because of prevalent gender inequality issues. In the Feasibility Study, avocado and macadamia have been identified as high economic value crops with high market potential, and the economic benefits of identified fruit trees is paramount to increase farmer adoption and buy-In. Since fruits and nuts take time to mature, short-term crops like chili and French beans will be promoted to support smallholder farmers with limited land resources (less than 0.4 ha) to create additional, more quickly generated income and incentivize adopting agroforestry practices. Regular income will help vulnerable communities to cope with climate variabilities and shocks.

The identified agroforestry value chains have market potential and potential for intercropping with short-term horticultural vegetables and fruits while providing further impacts on carbon sequestration, nutrition value, and market access in the CND. Selected fruit trees are expected to meet the dual purpose of soil protection and climate impact while generating long-term economic benefits to the most vulnerable community members of the CND region.

For each crop value chain identified, specific bottlenecks will be addressed while focusing on specific product-place combinations within the CND. Especially, attention will be on enhancing the quality and quantity of production in sync with particular demands from market niches, development of various models to improve access to finance together with financial institutions, and exploration of market opportunities that can generate off-farm jobs to absorb a good number of landless and other vulnerable groups of youth and women.

These priority crops are:

- Macadamia: a low-volume, high-value export crop; in-country processing creates jobs for women and youth. Two hundred and four trees cover one hectare, and one mature tree produces up to 60 kg of macadamia nuts per year with an income of 25,000 FRW per kilogram. Furthermore, every tree must be separated from the next by 7 meters; thus, many other commercial and consumable crops may be planted and harvested while waiting for macadamia's fruiting maturity.[105] The global demand for macadamia outweighs the available supply, which presents a huge business opportunity for macadamia farmers in Rwanda. For example, the current macadamia supply meets only 48% of global demand and the global market for macadamia is expected to further expand from $1.17 billion to $2.36 billion by 2027. The project will build on the government export initiatives to promote

105 DAPP Malawi, *Odetta Chimwaza – Macadamia Nuts project*. Link.

macadamia farming in CND areas through National Export Board (NAEB) and Rwanda Environment Management Authority (REMA) to include macadamia in its tree planting drive in the CND.

- Avocado: The extensive penetration of avocado cultivation amongst smallholder farmers (SHFs) and the favorable growing conditions lead to avocado yields (21MT/ha) that are nearly double those of Kenya. The increasing demand for export, and cash yield/ha are higher than maize or Irish potato. Through linkage to local avocado private value chain actors, packaged avocados will be exported to the European Union, where the channel price for avocados is $1.75 per kilogram, providing an estimated 32% margin.[106] Avocado production presents numerous opportunities to smallholder farmers in CND: for example, earnings from avocado exports have been increasing from $1.6 million in 2020/21 to $4.5 million in 2021/22 and production increased from 1,000 tonnes to 2, 500 tonnes in 2021/22. According to the NAEB, the production is set to double this year and generate $8 million from exports. To further strengthen its avocado exports the government has launched sea freight, which will not only increase export volumes but also make them competitive in terms of pricing.
- Avocado is projected to be the second most traded tropical fruit, after bananas, by 2030.The United States and the European Union, where consumer interest in avocados is fuelled by the fruit's health benefits, are expected to remain the main importers, with 40% and 31% of global imports in 2030, respectively[107]. The project teams in CND will work closely with private sector partners and communities to develop value chain analysis, business development strategies, and business planning. The team, led by our Livelihood Specialists, will work with these private sector partners to prepare action plans detailing technical services we will provide to train producers to supply commodities to markets.
- Vegetable crops such as French beans and chili: It has been demonstrated that these crops can double the income per hectare of maize and potatoes and employ a good percentage of the 16% reported unemployed women and youth[108]. Commercial farm wage reported labor in postharvest production handling at 72% women, 20% youth (see Annex 2.3). French beans can potentially deliver a gross margin of 22,040Rwf per acre and a return on labour of 2,755Rwf per day, while chili can offer a gross margin of 46,384Rwf per acre and a return on labour of 7,731Rwf per day.[109]

The Project will also enhance ecotourism and honey value chains. Particularly in areas close to national parks, the potential business development of ecotourism can go hand in hand with honey and wax product development. Our analysis shows that the honey value chain already has a sizable production history in Rwanda. Various initiatives exist that have encouraged farmers to invest in modern hives. However, the current sector is constrained by a perception of limited profitability due to low prices, gender patriarchy due to male dominance, and limited market access. The honey (and various by-product) value chain shows a wide range of different consumer target groups, whereas honey is too often marketed as a generic product. This is a crucial bottleneck: while the value chain actors engage in the business, there needs to be more incentives to invest financial resources to improve production or quality, such as through modern beehive technology. It will be essential to link ecotourism destinations and agro-tourism to enhance the potential for an improved business case and help beekeeping cooperatives enhance their processing, quality management, and marketing processes with large scale buyers and exporters such as Api Business Development Company (ABDC) and create a sustainable and expanded source of income especially for

106 Karuiru, M., 2018. Value chain management and the performance of avocado fruit small scale farmers in Kandara sub county, murang'a County, Kenya. *International Journal of Physical and Social Sciences*, *8*(10), pp.24-40.

107 OECD - FAO Agricultural Outlook. https://www.fao.org/3/cb5332en/cb5332en.pdf

108 Rwanda Development Board, 2020. Labour Market Trends Analysis Brief 2016-2020. https://rdb.rw/wp-content/uploads/2022/07/Labour-Market-Brief-2020.pdf

109 Van Keulen, Rik, Rumenera, P., Banjara, G., Colantuoni, M. and Muthamia-Mwenda, J. 2022. Horticulture value chain analysis – Opportunities for youth employment in Rwanda. Rome, FAO. https://doi.org/10.4060/cb8266en

women. Api Business Development Company has applied for EU certification in order to export honey to international markets. Nevertheless, the company–which has a capacity of handling 120 MT of honey per year–still faces the challenge of low production, inadequate even in meeting local demand.

Rwanda has a well-established record of generating off-farm benefits from its protected area ecotourism programs. The Project will build on this by supporting sustainable tourism activities around and between the Gishwati and Mukura Forests, as outlined in the GMNP Tourism Master Plan.[110] New trails and base camps outside of the parks will generate employment and income opportunities for rural women and youth, as well as attract tourism revenue to help support forest protection and management. In addition, this Project will initiate and train Community Freelance guides to mutually benefit the parks and local communities neighboring Mukura-Gishwati NPs. A freelance system suits the seasonality of tourism, and the demand and sourcing of guides from the local communities stimulates economic empowerment among the young and unemployed living in rural areas around protected areas. This initiative will enable community members to provide a service and generate income, and benefit from the growing tourism industry in Rwanda, which in turn supports conservation over the long term.

In collaboration with district authorities in the CND, who will provide a list of existing cooperatives, the project will select cooperatives based on value chains, number of women and youth, number of members with vulnerabilities and membership size. Furthermore, we will assess selected cooperatives using the Cooperative Assessment Matrix tool (CAM) to identify capacity gaps. Selected cooperatives, participating financial institutions (PFIs), and value chain actors/small and mid-size enterprises (SMEs) (including seedling producers, aggregators, traders, etc.) will receive capacity-building to improve their business skills and access to finance, and to strengthen value chains.

Women play a crucial role in balancing household demands with market production. This is why it is so important to give women access to financial and value chains related services. The project aims to reach at least 50% of the women beneficiaries in the project area. In areas where women are under-represented in value chains, the project will identify and address gender-specific challenges and barriers related to the different value chains and promote increased female representation and active participation in Producer organizations by creating gender committees that will recruit more women, and support women to be part of the leadership committees.

Key sub activities are:

3.2.1.1 Identify and map of vulnerable groups of youth and women within the community

3.2.1.2 Develop and implement strategies to ensure that women, youth, and other marginalized groups benefit from rural livelihoods and financial services.

3.2.1.3 identify farmers and cooperatives involved in selected value chains in consultation with district/local authorities in CND.

3.2.1.4 Assess capacity gaps of identified farmer organizations to strengthen their capacities

3.2.1.5 Identify and develop Nature-based tourism value chain as a means to generate viable economic alternatives for local people living near areas of high biodiversity in the CND.

RDB will co-finance sub-activity 3.2.1.5.

110 Rwanda Development Board (RDB), Rwanda Environmental Management Authority (REMA), 2018. *Tourism Development Master Plan for Gishwati - Mukura National Park.* Link.

Activity 3.2.2 Facilitate and scale up climate-resilient value chain products

The project will conduct deep analysis for identified value chains, namely macadamia, avocado, chili, and French beans. Such analysis will provide evidence of the opportunities and constraints in the selected value chains and will involve mapping out chain operators and service providers at each segment of the value chain to identify existing capacity gaps and orient overall value chain interventions in the project. Furthermore, value chain analysis will enable the project to clearly understand the characteristics of the selected value chain with attention to smallholder farmers, women, youth and vulnerable groups.

To build strong and sustainable value chains, the project will improve information flows within the chain, by strengthening coordination among value chain actors and supporters. This will involve creating value chain platforms in the CND region to increase transparency and fair business relations. The project will focus on activities that strengthen and scale up value chains: for example, by organizing business-to-business (B2B) events, establishing district value chain interprofessional/platforms, and promoting business development services such as swift, cost-effective, and accessible product certification for agribusiness. The project will play an active role by introducing key supporting functions such as financing, value chain information, certification services, etc., and advocate for fair business relations to ensure farmers are active players in value chains and not passive beneficiaries. The project will help strengthen the capacity of producer organizations in selected value chains. Often farmers fail to participate and benefit in value chain activities due to weak and poor organization, resulting from poor managerial skills and weak internal financial management. The project will use different capacity assessment tools like CAM and Scope insight to identify capacity gaps and develop capacity-building plans to ensure that producer organizations are strong and professional and capable of serving their members and building sustainable value chains. The capacity-building trajectory will also focus on encouraging participation by women, youth, and vulnerable groups and increase their access to services. Activities to strengthen farmers and producer organizations will be based on farming as a business (FAAB) concept to orient farmers toward business-oriented agriculture. Synergy will be built with projects such as KIIWP2 (Kayonza irrigation and integrated watershed management), a project funded by IFAD where this module is being applied.

In the selected value chain quality standards are an integral element of the core interventions, due to export market requirements. The project will strengthen the capacity of farmers to increase production in terms of volume and quality but also adhere to market standards (for example, global GAP, maximum residual limits (MRLs), etc.) Another challenge affecting the selected value chains in the CND region is access to inputs, especially seeds, and pesticides. This is exacerbated by the international market which requires certain seed varieties and types of pesticides. The project will strengthen the input supply system in collaboration by National Agricultural export board (NAEB) and selected off takers by establishing and supporting agro-dealers and nursery production through technical support and access to finance, to further access to input the project will also focus on building business models that help farmers access inputs via credit guarantee schemes. The project will create strong linkage and business relations between input suppliers, farmers/producer organizations, and markets/buyers to enhance flow of information among value chain actors. Based on experience, the project will ensure that processors/buyers have a say or influence on type, variety, and quality of inputs used by producers to ensure produce marketability. Furthermore, the project will collaborate with other projects like PSAC (promoting smallholder agro-export competitiveness project) and NAEB (National agriculture export board) to further build a sustainable input supply system. Most value chains are not well developed or are still nascent in the CND region, based on our experience with agroforestry value chains with the TREPA project for instance. In such situations, off-takers, processors, and traders are few and poorly organized, with minimal outreach to farmers. They normally experience challenges in understanding and meeting market standards (i.e., sanitary and phytosanitary (SPS) standards, Global GAP, hazard critical control point certification (HCCP), etc.) which limit their

competitiveness and market scope. The project will improve their capacity to meet these standards, provide other support to access and integrate cold chains, especially for avocado and French beans, and build out grower schemes in which off takers/exporters play a vital role. For MSMEs and start-ups, the project will strengthen their managerial capability for running successful, efficient businesses. Through organizing value chain linkage events (B2B, market linkage sessions, etc.) the project will enhance buyers to reach more farmers and producer organizations.

Addressing rural poverty and food insecurity using agriculture requires investments in off-farm agricultural activities to complement primary production.[111] Synergies will be created to reinforce direct linkages of small producers to other value chain actors with inputs (seeds and seedlings, fertilizers) and outputs (processors, wholesalers, and retailers).

The project will use the Market Systems Development (MSD) model to enhance value chain development. This will entail multi-stakeholder collaboration with business service providers, financial institutions, community-based enterprises, value chain actors, and farmer cooperatives. In-depth target area assessments will be conducted to tailor business cases for the selected value chains, particularly focusing on identification and engagement of existing farmer organizations and cooperatives, youth and women-owned businesses, and local small and medium enterprises (SMEs, value chain actors) with the capacity for production aggregation, value addition, and market potential to absorb production from smallholder farmers' cooperatives. This localized stakeholder and value chain exploration will serve as a basis for the organization of market linkages to help value chain actors better understand the market, challenges, and opportunities.

Regarding honey value chains, the project will estimate the number of beekeeping cooperatives operating in the targeted region or its surroundings. Members of these cooperatives will be trained in improved honey production techniques and adding value through wax-based products. This will involve establishing honey and wax storage stations and associated processing facilities. Cooperatives will also be an important vehicle for fostering tree growing for improved bee forage. The project will foster interactions between the cooperatives and private companies through business roundtables, trade fairs, and similar events focused on honey and beeswax products and this activity will be co-financed by RDB.

This activity includes in-depth target area assessments to tailor business cases for the selected value chains, particularly focusing on identification and engagement of existing farmer organizations and cooperatives, youth and women-owned businesses and local small and medium enterprises (SMEs, value chain actors) with capacity for production aggregation, value addition, and market potential to absorb production from smallholder farmers' cooperatives. This localized stakeholder and value chain exploration will serve as a basis for organization of market linkages to help value chain actors better understand the market, challenges and opportunities. Key sub-activities are:

3.2.2.1 Analyze identified value chains and promote them among the CND stakeholder networks

3.2.2.2 Strengthen the capacity of producer organizations to improve managerial capacities, farming practices, and gender inclusion in their organizations

3.2.2.3: Establish and strengthen relevant value chain platforms in the CND area and promote business development services to enhance value chain coordination.

111 Selasi, J., 2012. *Making Small Scale Farming Work in Sub-Saharan Africa*. In Global Forum on Food Security and Nutrition "FSN Forum", FAO.

3.2.2.4: Build and strengthen the capacity of off-takers (MSMEs, SMEs, and off-takers aggregators) to increase their competitiveness and comply with various standards

3.2.2.5: Facilitate and strengthen access to quality inputs for farmers and producer organizations in the CND regions

3.2.2.6: Establish "CND brand" for honey and wax products

Activity 3.2.3 Facilitate access to output markets for vulnerable farmers

Lack of access to the market is a challenge to smallholders: only 4.2% of agricultural households have access to contract farming (Agric HH Survey, 2017). Limited access to markets for smallholder farmers is mainly attributed to lack of access to market information, failure to meet market requirements, or undeveloped value chains. Some of the challenges also stem from poor quality and poor produce aggregation. The project will strengthen the capacity of farmers and producer organizations to improve quality and aggregation capacity, and in creating market linkages with off-takers or buyers through market information. The project will promote contract farming and out-grower schemes, where farmers are required to practice market-oriented farming, with the main objective of establishing long-term business relationships with markets/buyers. A focus on financial literacy and community initiatives will also mobilize domestic investment and expertise, facilitate access to financing, incentivize the private sector to create innovative financial products, and support improved data collection and measurement of outcomes.

Furthermore, through producer organizations, the project will develop an inclusive business model to improve produce aggregation and supply coordination and to increase farmers' bargaining power and influence in formal value chains, particularly for remote/hard-to-reach women, youth, and vulnerable groups. To further strengthen market access, the project will develop innovative market access approaches such as "it takes two to trade", which focuses on understanding the challenges and weaknesses that limit demand (traders) and supply (farmers). The project will create interventions to eliminate challenges and improve weaknesses to build sustainable market access. The project will also build on the national digital agriculture strategy (NDAS) to introduce digital market access, where farmers access market information through their mobile phones through USSD or IVR interactive voice response. A similar intervention is currently being implemented in the Kayonza district through an IFAD-funded project: Strengthening Agriculture Resilience through Learning and Innovation (STARLIT). This approach is particularly customized to poor, rural, and hard-to-reach farmers who do not own smartphones.

To implement this, the project will identify and select two buyers/off-takers for each selected value chain based on market needs and link them to farmers and farmer organizations. The eligibility criteria for buyers/off-takers will be developed by RFA in collaboration with CORDAID during the implementation. The project will organize periodic market linkage events and business-to-business (B2B) workshops through established value chain platforms. Additionally, the project will create a clear link between market access and other value chain supporting functions, such as value chain finance, to ensure that farmers have access to working capital for aggregation and marketing. Various models will be developed including tripartite agreements (buyers, producer organizations, and financial institutions) to increase confidence among partners and financial flow.

The activity will work to scale up the market system developed using the Output 3.2 inception report on beneficiary persona and stakeholder engagements to facilitate market system growth within the selected value chains, including bee products, and other women and youth-focused sectors. The activity will work to scale up the market system developed using the Output 3.2 inception report on beneficiary and stakeholder

engagements to facilitate market system growth within the selected value chains, including bee products, and other women and youth-focused sectors such as adoption and sales of fuel-efficient cookstoves.

The project will also build strong business relationships and linkages between input suppliers, markets, and farming cooperatives. This will build common understanding and smoother flow of information to ensure that input suppliers and farming cooperatives respond swiftly to what markets need. The activity will train vulnerable groups and farming cooperatives on “farming as a business” concepts.

Finally, trade agreements will be created between cooperatives and relevant national and regional companies that buy and sell such products. The Project will support and ensure protection of the interests of the cooperatives and their members while negotiating and signing relevant agreements for win-win situations.

Key sub-activities:

3.2.3.1 Develop an inclusive business model to Integrate vulnerable farmers into formal markets

3.2.3.2 Organize microenterprise training and develop and implement green grants programs targeting landless youth and poor, as well as women who are unable to access direct benefits from land-based project activities.

3.2.3.3 Facilitate market access for women, youth, and historically marginalized communities through market linkage sessions

3.2.3.4 Provide technical support on market standards, contract farming, and financial connectivity.

3.2.3.5 Develop various market access channels including digital market access for rural farmers, especially women and marginalized groups

Activity 3.2.4 Scale up use and sales of clean fuel-efficient cookstoves

The project will actively promote the use of energy-efficient cookstoves to benefit the 90% of households in the CND that depend primarily on firewood to meet their cooking energy needs and thus contributing to accelerated forestry resources degradation while causing profound health hazards to the already impoverished community. .

This intervention will reduce pressure on forests and farmland by raising household awareness of the differences between high and low efficiency stoves and by collaboration with the local TVETs institute to manufacture affordable efficient stoves that will address the limited availability of high-efficiency stoves in rural markets. Promoting the local fabrication will reduce dependency on cookstoves made outside the country and therefore make them affordable. Also, promoting locally made cookstoves designed to address local needs will lead to full adoption of improved cookstoves and will contribute to sustainable biomass resource use and prevent overexploitation of forest resources, thereby ensuring the success of the forest landscape restoration activities described in Outputs 2.1, 2.2, and 3.2 above.

The project will adopt a market-oriented approach to strengthen the cookstove supply chain in the CND and create strong linkages and business relationships with several ecosystem including the TVET center for training of youth and women SMEs on cookstove manufacturing and repairing , and microfinance institutions (MFIs) to ensure sustainable access and finance of cookstoves business.

As mentioned above, to ensure product quality and affordability to drive uptake, scalability, and business growth and expansion , the project will partner with integrated polytechnic regional colleges to develop a

Tier 2 (for emissions) prototype compatible with rural settings and affordable to rural communities. Youth-led SMEs will be trained on how to manufacture cookstoves and contracted to produce them as well as operating sales points within the community

The cookstove pricing and financing modality will take into account vulnerable groups, including historically marginalized groups mapped and selected in sub-activity 3.2.1.1 (social wealth categories c, d, e, and people with disabilities). For sustainability, the groups will be organized into saving groups and ensure they lend among themselves with the purpose of purchasing the cookstove , the project subsidies may target women-headed households which has contributed over a percentage of the total cost . Additionally, the product design will incorporate reducing health hazards , such as reducing respiratory diseases risks and others linked to climate impacts , contributing to reduction in morbidity and health treatment cost and enabling the vulnerable to have disposable income for investment into productive ventures and this will ensure sustainability of impacts beyond the GCF financing. Moreover, the project will target women-headed households, recognizing the significant role women and children play in firewood collection and cooking. The project will substantiate the time-saving benefits for fuel collection and links to women's decision-making and empowerment with clear indicators.

Considering the lessons learnt from similar projects where hand-outs lead to poor sustainability, this project will promote alternative income sources from fast-maturing crops such as chili and French beans which have ready market in Rwanda and externally. The members of the saving groups will be able to use income generated from the sale of fast-maturing crops (chili and French beans) coupled with savings accumulated from their groups and save progressively to purchase the cookstoves and replacement . The project's technical support to MFIs will build their capacity to develop tailored financial products for cookstoves with affordable repayment terms aligned to revenue streams from short-term crops and group savings, making it easier for farmers to access loans to buy cookstoves.

GCF funds with co-financing from RDB will provide support for the development of ICS prototypes, youth-led SMEs engaged in cookstove production, subsidies for cookstoves, creation and support of savings groups, and technical support to MFIs to develop tailored financial products to facilitate access to ICS by local communities. The project will ensure that the cookstoves are sustainably sourced and lead to minimal indoor air pollution and related respiratory conditions compared with the cooking methods presently in use both during production of the cookstoves and during usage by the individual households.

Key sub-activities are:

3.2.4.1. Promote local manufacturing through partnership with Integrated Polytechnic Regional Colleges (IPRCs) of Karongi and Musanze to help design prototype Tier 2 ICS to address local constraints .

3.2.4.2. Build business and marketing capacity of the cooperatives and youth led SMEs to act as the marketing channels of energy efficient cookstoves to CND community members based on wealth categories.

3.2.4.3 Create a specialized small business development fund, to help local women and youth groups build innovative business models for accelerated distribution of ICS.

3.2.4.4. Promote demand-through raising public awareness on the benefits of ICS by developing and disseminating messages on mass media and in community meetings.

Output 3.3 Financial services & private sector investment increased

Financing challenges and needs are particularly high in clean cooking, mainly for two reasons: (1) due to lack of income, the upfront purchase of clean cooking equipment presents an affordability challenge to most

households, which adds to the monthly fuel expenditures and (2) businesses operating in the sector are often unable to attract financing for for investment in the value chain . Serving low-income households also generally yields low returns due to low customer base.

With a particular focus on marginalized communities, and vulnerable groups of youth and women in the CND, the Project will deploy a FSG model to capacitate the communities' productivity and financial resilience. The project will address barriers to access to financial services, specifically for women and youth by building the financial institutions to develop and financial products that meet the differentiated needs of vulnerable women and men in the CND. The project Gender Expert, Youth Focal Point along with the Community Mobilization Specialist and Community Engagement Specialist will provide support to address barriers to access, ensure women's financial skills are developed and there is community and financial institution awareness and support to ensure marginalized groups, including women and youth can access financial services including credit to invest in their businesses including purchase of the cookstoves. Besides this, to address the significant challenges facing MFIs and Participating Financial Institutes (PFI) such as limited understanding of forestry and agriculture sectors investment and the corresponding risks associated with climate change effects on credit repayment, this Project will coach the participating financial service providers to enhance their on assessing the impact of climate change on their clientele and loan portfolio, and ensure equitable access to financial assets by women, youth, and historically marginalized communities. Furthermore, the Project will facilitate local and international impact investors and PFIs to engage in investment and credit provision for farmer cooperatives and SMEs in the selected value chains.

In collaboration with TVET institutes/ICS youth producers and central (RFA, MININFRA) and local authorities (Districts), CND biomass and micro-finance experts will refine and test, for each type of ICS/fuel to be promoted, the category/profile of households to be targeted and the related subsidy/microcredit schemes to be implemented to facilitate stove adoption with minimum concessionality. These schemes will be designed to align with the procedures and rules of identified local partner financial institutions.

In addition, the financial products will be consistent with climate resilience and capacity-building for macadamia, avocado, vegetables, honey and ecotourism value chain actors under Outputs 3.2.3 and 3.2.4. Techniques will be developed to analyze and score forestry and agroforestry value chains that are climate-resilient.

Activities and sub activities under this output will be executed by the Rwanda Forestry Authority (RFA) with the technical support from WCS.

Activity 3.3.1 Facilitate access to finance & private sector investments

To de-risk the selected forestry and agroforestry-related value chains, the Project will organize sensitization sessions for value chain actors and private financial institutions to build a common understanding with regard to the selected value chains. This will also include introduction of monitoring and measurement systems to support the risk and climate impact assessment on the value chains to be undertaken by the financial service providers.

Communities involved in chosen forestry and agroforestry value chains in selected intervention sub-areas will be selected with a particular focus on landless people, historically marginalized communities, and vulnerable groups of youth and women in collaboration with local authorities (districts & sectors) and community representatives.

Furthermore, the interventions will capitalize on the fast outreach of informal saving groups. Saving groups are self-managed and self-capitalized entities that use members' savings to facilitate lending within the

group. They set up clear rules and regulations which are known and adhered to by all group members. Groups consist of a limited number (10-25) of people who have freely chosen to work together, and offer self-managed savings, insurance, and credit services in remote rural areas. Poorer segments of the community often do not have a regular source of income–however, within a savings group, people can save to purchase agricultural inputs, such as seeds, fertilizer or equipment. Savings groups may also provide mutual assistance for group members, such as medical insurance or loans to members in need.

Saving groups have transformed marginalized communities by mobilizing local savings, which provide members with a means to cope with emergencies, manage household cash-flow, build a capital base, and, crucially, re-build social networks, solidarity and trust. Savings group participants often do not have regular sources of income and commonly come from poorer segments of the community. Women are regularly involved in savings groups and have high participation rates. Saving group participants often come from the same socioeconomic background and know each other.

Activities of saving groups include:

- SAVING: The group determines a fixed amount for a given period that each group member will bring to the savings account. The allocation and management of these savings can vary according to the needs of the members or is used to support group activities.
- LENDING: The group can grant small internal credits to members. Loans are modest and repayable in the short term. Interest rate is fixed by members. At the request of the group, these credits are renewable almost automatically if there is no problem and if the amounts are within a ceiling set by the group.
- SOCIAL: The group not only improves the lives of its members financially but also socially as members are given the opportunity to socialize at each meeting and discuss other issues or concerns. The group further builds a small social fund to help group members in distress. Each group agrees on the amount to be saved, usually a smaller amount than the amount for regular savings, in every meeting for the social fund. This money is not loaned, but instead used to pay group member expenses for things such as funeral costs or medical treatment and are only used if agreed on by all group members.

In case of external loans from financial service providers, which most members can't afford, group members agree to mutually guarantee each other (co-guarantee) when taking a loan. If a member does not pay, the group ensures repayment for him/her**.** The group uses moral pressure to force repayment and therefore there is no requirement for physical guarantees with third parties such as financial institutions. The internal character assessment for group members is important.

The project will strengthen the capacity of saving groups and link them to more formalized financial institutions. The project will further enhance financial education and client protection principles.

This model is more convenient and more accepted by most women who cannot afford collateral loans. As such, this approach will attract more women and will facilitate their formal access to financing over time. Specific attention will also be paid to women's participation in other project financial products that will be developed, such as asset finance in activity 3.3.2.

The project will digitize saving groups, to reduce time and cost spent to access their savings, thereby facilitating transactions with formal financial institutions. Solutions such as "push and pull technology" (i.e., payments using cell phones, commonly referred to as "mobile money") have proven to be useful and convenient for savings groups to send and receive money.

In activity 3.3.1, communities involved in chosen forestry and agroforestry value chains under this project in selected intervention sub-areas will be selected with a particular focus on landless people, historically marginalized communities, and vulnerable groups of youth and women in collaboration with local authorities (districts & sectors) and community representatives.

Sub-activities include:

3.3.1.1 Develop tailored credit assessment tool for selected value chains, while integrating climate impact data

3.3.1.2 Facilitate access to finance for selected value chains of avocado, macadamia, vegetables and ecotourism that are relevant to build climate resilience

3.3.1.3 Develop tailored financial products to meet the needs of women and youth

Activity 3.3.2 Set up and support savings & loan groups, enhance asset-building

To strengthen the capacity of local smallholder farmers in financial literacy and access to finance, farmers' cooperatives will be assisted and supported in setting up saving groups. Savings groups are a proven and effective approach to the financial inclusion of the most vulnerable and are increasingly recognized as one of the strongest forms of community organization available due to the high levels of social capital generated from its savings approach. Saving groups create a platform for linkage with financial institutions and other business development services. Further, savings groups are recognized for enabling high levels of female inclusion. As groups members co-guarantee each other for accessing a loan and groups are strong, it forms low lending risks for MFIs since members mutually reinforce each other's repayments.

Once grouped, small savings group members, especially women, grow from accessing internal group loans to accessing formal financial institution loans. As members' bankability and trustworthiness increases, members are able to start accessing individual loans, gradually building to larger loans and are able to open individual savings accounts at financial institutions.

Members of a saving group will be self-selected and the saving group will be managed by its members. Self-selection will be based on the following:

- Knowledge of one another and similar economic background
- Close proximity to where the meetings will be held
- Reputation for honesty and reliability
- Ability to attend all meetings on time and follow rules
- Have a cooperative personality
- Be able to buy at least one share each week (or time set by the group)
- Be able to repay loans on time

Most saving groups are informal but transparent, democratic, and structured groups that have constitutions and clear rules. Members do not enter into contractual arrangements for their membership. Record-keeping is based on simple passbooks in which each member's savings and loans are recorded; all transactions are done in front of the members during group meetings.
Farmer savings groups (FSGs) will be created within cooperatives and farmers will decide which group to join. Groups will set up governing rules and conditions (savings amount, meetings, etc.), and criteria for new members who want to join. Particular attention will be given to social inclusion (including vulnerable communities and landless people).

Youth and women-owned businesses selected for activity 3.2.2 will be linked to targeted FSG beneficiaries for supplying inputs (modern beehives, seedlings, etc.) and energy-efficient cook-stoves. Furthermore, intensive capacity-building and technical support will be delivered to all groups with emphasis on financial literacy, entrepreneurship, and gender mainstreaming. The activity will also help link savings groups to PFIs.

For Activity 3.3.2, in collaboration with local authorities, the project will target existing or potential youth and women-owned businesses that can intervene at any level of selected value chains in activity 3.3.1. The project will ensure the integration of vulnerable and landless people.

Key sub-activity:

3.3.2.1 Establish/form saving groups for access to finance

3.3.2.2 Provide organizational, technical, and financial capacity-building to women, youth, and CSOs (such as cooperatives or VSLA) with focus on financial literacy and provide long-term coaching to beneficiaries

3.3.2.3 Support women, youth, and other marginalized groups to strengthen savings and loan groups and register for MFI accounts

Activity 3.3.3 Build the capacity of financial institutions to serve targeted value chains and communities

Many financial institutions demonstrate little knowledge about the science of agriculture, forestry, climate change and associated risks. A study by the International Food Policy and Research Institute (IFPRI)[112], noted that many agricultural activities are located in remote, widely dispersed regions and that financial institutions find it impossible to provide cost-effective and affordable services in this context. Hence for this specific activity, PFIs will be supported to access and adopt a digitalized forestry and agri-loan assessment tool, and to understand climate impacts on their portfolio to actively integrate and promote climate relevant financial products in their product offer.

The Project will work with these institutions by developing and refining appropriate financial products and financing operations that are better understood and user-friendly for smallholder farmers and vulnerable groups. The Project will also collaborate with selected PFIs to build their awareness of prospective farmer and low-income group clients and their exposure to climate impacts.

Key sub-activity:

3.3.3.1 Capacity-building of PFIs

Activity 3.3.4 Facilitate learning & knowledge sharing

To deliver an adaptive program that cooperates with market actors on inclusive and sustainable business models that have a positive impact on smallholder farmers, while generating and sharing lessons on which business models work and which do not, the project will adopt the program-embedded reflection and learning (PERL) model for facilitating learning and knowledge sharing to popularize the CND unique approaches to restoration and environment management.

By **proving,** we seek to know and show what works and what does not work by demonstrating results at all levels, generating deeper insights into farmer benefits and the effects on the wider ecosystem, and building business model sustainability.

112 Kloeppinger-Todd, R. and Sharma, M. eds., 2010. *Innovations in rural and agriculture finance* (Vol. 18). Intl Food Policy Res Inst.

By **improving,** we learn by doing to enhance project adaptation and improvement, build a learning culture through discussion and reflection, generate knowledge to support project effectiveness, make comparisons over time, and enhance data quality procedures.

Through **sharing,** we disseminate high-level results and learnings to relevant audiences, contribute to visibility and communication, showcase successful, sustainable and scalable business models, and generate best practices.

Under this activity we will go through the following actions to prove, improve and share:

Capture - We will establish a KML framework and support case studies and discussion by project staff; improve data collection; collect insights from field visits; write human interest stories; hold quarterly program reviews; measure client satisfaction; and collect information on business models, market uptake, and ecosystem changes.

Synthesize - We will organize discussions and quarterly program reviews with program staff and stakeholders for assessment, interpretation, reflection, and learning from results. Outputs will include reports, briefs, and articles.

Disseminate - We will contribute to and support the project, presenting its achievements in newsletters, conferences, webinars, blogs, publications, media events, partner workshops and sector network presentations.

Take action - We will have regular discussions and reviews in which we revisit the work plan and processes in light of results and insights (e.g., based on outreach data, field visits, case studies, partner feedback, quarterly reports, changes in the ecosystem, etc.), and adapt operational planning when needed (within and outside of the normal project planning and reporting cycle).

Refine agenda - We will help to align the project intervention strategy with a shared vision for success.

The table below summarizes the project activities to be implemented in Congo Nile Divide.

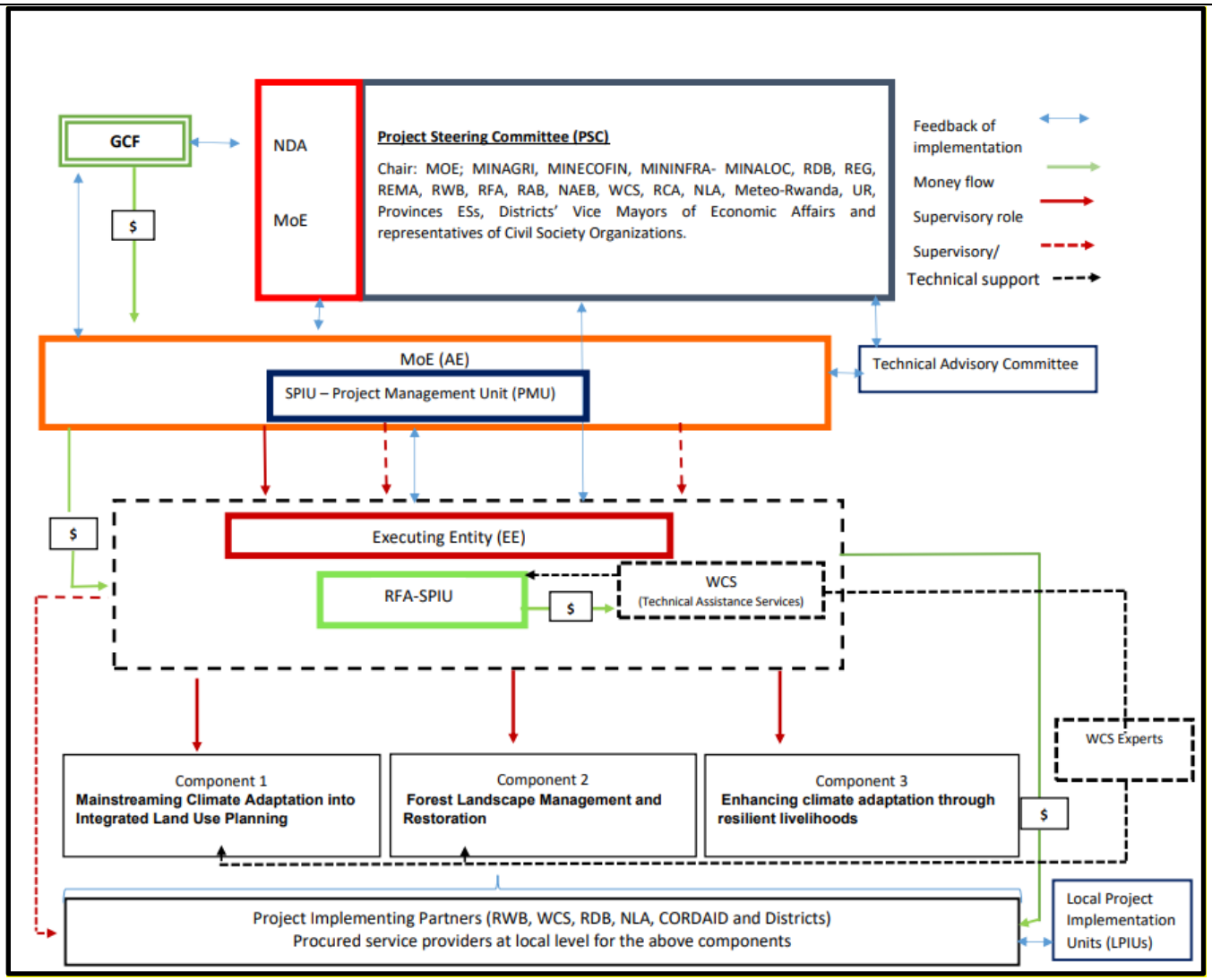
	Core PA Nodes				Stepping Stones			Landscape Linkages			Broader Farming Mosaic					Across the CND
	Volcanoes NP and Buffer	Nyungwe NP and Buffer	Mukura NP and Buffer	Gishwati NP and Buffer	Gishwati Pastures Stepping Stone	Karehe-Gatuntu Stepping Stone	Dutake Stepping Stone	Nyungwe NP to Mukura NP Linkage	Gishwati NP to Volcanoes NP Linkage	Mukura NP to Gishwati NP Linkage	Nyungwe to Mukura Broader Farming Mosaic	Volcanoes Broader Farming Mosaic	Mukura Broader Farming Mosaic	Gishwati Broader Farming Mosaic	Nyungwe Broader Farming Mosaic	
1.1.1 Synthesize & disseminate information on value of natural forests & ecosystem services																■
1.1.2 Develop climate-resilient landscape land-use plan																■
1.2.1 Create interagency taskforce institutionalizing integrated landscape planning & policy																■
1.2.2 Build capacity for spatial planning in national agencies re climate change																■
1.2.3 Develop an effective forest monitoring system to underpin forest management decisions	■	■	■	■	■	■	■									
2.1.1 Facilitate revision of PA management plans to address climate risks	■	■	■	■												
2.1.2 Establish long-term plans for CND financial sustainability post-GCF	■	■	■	■												
2.1.3 New fire management curriculum developed and operationalized in PAs and adjacent landscapes	■	■	■	■												
2.2.1 Secure key remaining natural areas outside PAs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
2.2.2 Restore natural forest cover in & outside PAs including riparian linkages	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
2.2.3 Promote silvo-pastoralism with indigenous trees in Gishwati Pasture Stepping Stone areas					■											
3.1.1 Restore high slope areas (>55%) as protective forests	■	■	■	■	■	■	■	■	■	■						
3.1.2 Develop on-farm agroforestry for high caloric and indigenous tree species	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
3.2.1 Develop agroforestry related value chain for markets access	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
3.2.2 Facilitate & scale up capacity, value addition & marketing of select climate-resilient value chain products																■
3.2.3 Facilitate access to input & output markets for vulnerable farmers																■
3.2.4 Scale up marketing, production, sales, use of fuel-efficient cookstoves																■
3.3.1 Facilitate access to finance & private sector investments																■
3.3.2 Set up & support savings & loan groups, enhance asset-building																■
3.3.3 Build capacity of financial institutions to serve targeted value chains & communities																■
3.3.4 Facilitate learning & knowledge sharing																■
4.1 - Performance monitoring plan developed																■
4.2 - Project monitored and evaluated; lessons learnt integrated into adaptive management processes																■

■ Primary Focus
■ Secondary Focus
Some activity

Table 4: Summary of project activities (place based and non-place based) to be implemented across the Congo Nile Divide.

B.4. Implementation arrangements

The proposed project will be implemented in five years, from 2024–2029. The Ministry of Environment (MoE) is the Accredited Entity (AE) for the GCF and MoE will enter into a funded activity agreement with the GCF once the project is approved by the Board.



The governance arrangements for the project at the national level are designed to build upon the institutional structure of MOE (the accredited entity) and RFA (the Executing Entity).

Accredited Entity: The MoE on behalf of the Government of Rwanda is a Direct Access Entity of the GCF and will assume the oversight role on implementation, management, monitoring, evaluation and reporting on the CND Program elaborated in the FAA. The MoE will enter into a subsidiary agreement with the Executing Entity (EE) with clear roles and responsibilities for each party. Under the Ministry of Environment there is a Single Project Implementation Unit that has a number of staff charged with resource mobilization and providing oversight over different projects implemented through the Ministry of Environment. The MoE/SPIU has a track record of experience in project oversight, management, monitoring and evaluation of projects and programs including the GCF funded FP073 that is currently at the mid-term level of implementation with over USD 32.8 million, managed over USD 3.8 million for the GCF funded PPFs, overseen the implementation of USD 10 million from Adaptation Fund. The MoE is currently managing the World Bank Funded project preparation advance of USD 6 million and has been implementing since 2018 a program funded by the UNDP focused on Strengthening Capacities of Environment and Natural Resources Sector for a Green Economy Transformation of over USD 6 million. Additionally MoE assumes its oversight role through chairing of the Project Steering Committee for different projects implemented under the Environment and Natural Resources Sector as a whole namely TREPA, a GCF-funded project, Rwanda Urban Development Project Two funded by the World Bank and NDF, an Early Warning System project

(funded by LDCF), the Landscape Approach to Forest Restoration and Conservation (LAFREC) programme (funded by GEF/World Bank), Green Amayaga Project (funded by the GEF) and the "Building resilience of communities living in degraded forests, savannahs and wetlands of Rwanda through an ecosystem management approach" programme (funded by LDCF). A coordination platform between approved GCF projects will be established to identify, maximize linkages and ensure complementarity through learning and sharing best practices and failures arising from the implementation of existing GCF projects. Quarterly meetings will be organized under the supervision of the MoE between project directors and staff responsible for monitoring and evaluation to share lessons learned.

Project Financial Flow and AE Roles

Funds from GCF will be provided to the MoE GCF account (as the AE), under the terms of the FAA. MoE will be responsible for financial management and accountable for the use of GCF resources. Financial transactions will be subject to annual audits undertaken by internationally certified auditors. In addition, as the AE, MoE will: i) ensure that the project is executed in accordance with GCF standards; ii) supervise, oversee and manage the implementation of project interventions; iii) report on Project progress; and iv) ensure that Project activities are well coordinated and aligned with countries' national priorities. MoE will provide oversight to the project consisting of a) entering into subsidiary agreement with the EE; b) managing and disbursing GCF funds to EE on the approved work plans and budgets; c) reviewing financial expenditures and progress reports; d) overseeing Project implementation in accordance with the Project document and Annual Work Plans and Budgets, agreements with co-financiers and executing entity rules and procedures; e) providing technical guidance to ensure that the appropriate technical quality is applied to all Project activities; f) providing financial reports to the GCF for Project funds received; g) ensuring that the project complies with the terms agreed in the Project's respective FAA as well as the AMA signed between MoE and the GCF; and h) undertaking regular annual supervision missions according to the MoE's guidelines and convene Project Steering Committee (PSC) meeting twice a year aimed to review progress and approve work plans. The PMU hosted under the Single Project Implementation Unit of the Ministry of Environment will manage, monitor and report on day-to-day implementation of the Project activities by the EE. The EE will execute the tasks within the overall project management structure: a) implementing day-to-day activities as per the project work plan and budget, including the Environmental and Social Management Plan; b) undertaking procurement activities as per the agreement signed by GCF and AE as well as the sub-agreement signed by the AE and EE; c) managing contracts of suppliers and services providers; d) hiring and managing project staff relevant to the EE-managed project areas; e) implementing activities as per the project work plan; and f) carrying out financial and technical monitoring of activities, including the achievement of outputs and outcomes the EE is in charge of. EE will enter into Memorandum of Understanding with different implementing partner agencies that will provide technical know-how to the implementation of the project activities. The implementing partners including but not limited to RWB, WCS, NLA, RDB, CORDAID and Districts will provide technical and operation services articulated and agreed in respective MoUs. For the Implementing partners RFA will be paying service compensations and at District Level community approach will be used. Procured service providers will be contracted in accordance with MoE rules and regulations of procuring goods and services.

Project Steering Committee (PSC): 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 semi-annual 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 and EE/PIU. 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 PSC will reflect the multi-sectoral nature of the project and will include senior-level representatives from GoR and other relevant Stakeholders. The PSC will be chaired by the Permanent Secretary, MOE or any Senior Manager from MoE delegated by the Permanent Secretary with representatives from: MINAGRI, MINECOFIN, MININFRA- MINALOC, RDB, REG, REMA, RWB, RFA, RAB, NAEB, WCS, RCA, NLA, UR, Provinces ESs, Districts' Vice Mayors of Economic Affairs and representatives of Civil Society Organizations.

Project Management Unit: It is under the MoE/SPIU that a dedicated Project Management Unit (PMU) of the CND program to supplement the existing MoE/SPIU structure for this complex program will be established for day-to-day management of the program interventions. The Project Management Unit (PMU) will be headed by the Project Coordinator who will serve as the secretary and the rapporteur of the PSC. The Project Coordinator and other PMU staff will be recruited as per the MoE/GoR recruitment practices. The Project Coordinator is responsible for the day-to-day operations of the PMU within approved project funded activity agreement and any other guidance provided by the AE and PSC including the tasks of managing and monitoring project risks initially identified and submitting new risks to the AE and PSC for consideration and decision-making on follow-up actions and updating the status of risks in the project risk log. The PMU Project Coordinator will report to the overall MoE/SPIU- Coordinator as the immediate supervisor and to the Permanent Secretary as the secondary supervisor.

The PMU will provide to the MoE/SPIU coordination and to the Chair of PSC with quarterly progress reports and close its operations when the final project evaluation report and other documentation required by the GCF have been completed and submitted to MoE. The PMU will be staffed with required professional and technically qualified personnel selected and recruited following the MoE/GoR procedures. In all, the PMU will strive to maintain a lean management structure. It will comprise a Project Coordinator, Monitoring & Evaluation (M&E) Specialist, E&S Specialist, Procurement Specialist, Gender Specialist, Financial Management Specialist, Communication and Outreach Specialist, Office Manager, and Driver as a dedicated team to manage the EE for the whole program.

Executing Entity: RFA will serve as the EE for the Project through a subsidiary agreement (SA) signed with MoE. The SA will establish clear roles and responsibilities for both parties for the delivery of the project activities, the schedule and conditions for installments, the determination of the prevailing fiduciary standards and the terms and conditions for arbitrations and termination of contract. The SA will include specific obligations for the EE on project execution, financial management, personnel administration and reporting, as well as on arbitration and liability terms.

Rwanda Forest Authority: RFA was established by the Government of Rwanda by the law No 72/2019 of 29/01/2020 with the mission of ensuring the growth of forest resources, their management and protection for sustainable development purposes. RFA is an affiliated agency under the MoE with a separate legal personality and a budget entity of the Government of Rwanda. RFA is currently implementing TREPA; a GCF funded project as one of the executing entities, COMBIO Project funded by the Swedish government, executed Forest Management and Biomass Energy project (FMBE) implemented in the Northern province; Sustainable forestry, agroforestry and biomass energy management for climate resilience in Gatsibo and Gicumbi districts; and Improving the Efficiency and Sustainability of Charcoal and Wood Fuel Value Chains in the North-western part of Rwanda supported by the Nordic Development Fund. RFA has three main divisions namely Forest Research Division, Forest Management, Administration and Finance and an established Single Project Implementation Unit (SPIU), composed of staff with the required financial management skills where the CND Staff will be hosted. The Director General of RFA as the Chief Budget Manager, the RFA SPIU Coordinator together with Program Manager and a Financial Management Specialist will be responsible for the day-to-day financial management of the Project. RFA SPIU will open a separate account at the National Bank of Rwanda (BNR), from which payments of the Project activities will

be made from. RFA follows the same financial and procurement policy as the one of the Ministry of Environment.

WCS Technical Assistance (TA) Services: As one of the project implementation partners, WCS will provide technical assistance to the EE (RFA) through an MOU signed with RFA. The MOU will detail all the activities that WCS will be directly supporting during the implementation of this project. The TA services will include advising RFA/SPIU, procuring and supervising international experts and consultants, and procuring materials to support the execution activities. Relevant technical experts from WCS will be embedded within RFA to advise SPIU on day-to-day project management to support the implementation of activities under outputs 1.2, 2.1, and 2.2. These experts will support RFA's technical teams and strengthen their capacities in different aspects of the project implementation. Furthermore, WCS technical assistance services will include supporting the development of ToRs and reviewing works of international consultants to ensure high quality deliverables.

CORDAID Technical Assistance Services: CORDAID will provide technical assistance to RFA mainly on output 3.2 and 3.3 through an MOU signed with RFA.

Other Government of Rwanda implementing partners will provide implementation support and RFA will enter into specific MOUs with these partners based on the type of support they will provide.

Table 5: Summary of project outputs. The EE will be responsible for all activities and sub-activities of the project, receiving support from technical implementation partners.

Outputs	**Executing Entity per output**	**Technical Implementation Partners**
Output 1.1. Landscape-wide land-use plan developed for climate-resilient livelihoods & forest ecosystems, integrating district development strategies (DDS)	RFA	WCS and NLA
Output 1.2. Local & national institutional capacities strengthened to integrate biodiversity & climate risks into land use planning & management	RFA	WCS and NLA
Output 2.1. Protected areas management effectiveness improved to address climate risks and adaptation	RFA	WCS and RDB
Output 2.2. Natural forest cover restored; biodiversity connections established	RFA	WCS
Output 3.1. Farming methods enhance productivity, reduce erosion & flooding risks, contribute to ecosystem services, and support connectivity	RFA	RWB

Output 3.2. Rural livelihoods generate alternative incomes and reduce pressure on forests	RFA	CORDAID
Output 3.3. Financial services & private sector investment engagement	RFA	CORDAID
Monitoring and Evaluation	PMU	

Technical Advisory Committee (TAC) will be responsible for ensuring technical guidance to both the project execution team and the PSC. The TAC will have technical representatives from all project stakeholders including MINAGRI, MINECOFIN, MININFRA, MINALOC, RDB, REG, REMA, RWB, RFA, RAB, NAEB, WCS, RCA, NLA, UR, Districts representatives and representatives of Civil Society Organizations. The TAC will be engaged in providing technical support and quality assurance of the project implemented activities as well as facilitating effective implementation and mainstreaming of project interventions beyond the life of the project. The institutional stakeholders will nominate relevant technical experts to the TAC, thus bringing expertise from their respective institutions to make technical contributions to the project implementation based on the integrated nature of the project.

The project will use the GoR fund management modalities based on an annual work plan developed by the PMU together with EE and subsequently approved by the PSC. The Annual Work Plan (AWP) indicates which activities should be covered at PMU and EE levels as per the allocated respective budgets. The EE, together with support from implementing partners, will establish Local Project Implementation Committees (LPICs)specific to the zones of intervention in the Western and Southern Provinces of Rwanda. Two LPICs will be established; one for the Southern province and another one for the Western province for the coordination of activities in Western (GMNP) and southern (NNP) Rwanda to ensure synergies and complementarity between partners. These teams will work closely with the Joint Action Development Forums (DJAF) based in each district located in these respective zones. LPIC will be composed of representatives of districts in charge of natural resources management, RDB, CSOs, and conservation organizations, women and youth councils and JADF. This arrangement will ensure that a) project delivery can proceed securely and efficiently despite the complex governance framework; and c) government partners play a leading role in project delivery and capacity development. PSC will provide policy direction and guidance to improve the coherence and efficiency of this innovative approach to be developed as an up-scalable model. At the local level, the EE and its service providers will coordinate closely with districts to ensure smooth local level coordination in project implementation, provide ownership and ensure sustainability. The District Executive Directors (DEDs) are expected to play an active role in project implementation, facilitation and monitoring and play a key role in the grievance redress mechanisms, as described in the Environmental and Social Management Plan of the project.

B.5. Justification for GCF funding request

Rwanda has achieved remarkable social, political, and economic progress over the past two decades. The Rwandan economy has grown well above average compared to its peers and the rest of the world, achieving growth rates of more than 8% regularly, with a 9.4% growth rate in 2019[113]. However, the economy which is

113 National Institute of Statistics of Rwanda, 2020.

dependent on nature-based tourism and agriculture is extremely vulnerable to external shocks, including climate change.

Climate change is likely to increase variability in crop yields and agricultural production, cause severe flood damage to physical infrastructure, reduce labor productivity, and impact demand for tourism[114]. The recent Country Climate and Development Report (CCDR) estimates that if these risks materialize, Rwanda's GDP levels can drop by 5–7% below baseline in multiple years by 2050[115], with negative impacts on private consumption, exports, and government revenues. By strengthening resilience to climate change, Rwanda can better prepare to manage the adverse impacts of climate change. Implementing the commitments articulated in the NDC is estimated to require new investments of US$11 billion, of which close to US$7 billion is conditional on new financing.

Rwanda is classified by the U.N. as a Least Developed Country (LDC)[116] and lacks sufficient public financial resources to implement its climate change and resilient green development objectives. The implications of climate impact for Rwanda demands concerted action and support both locally and internationally to enable the mainstreaming of climate resilience into public, private and community sectors at the pace and scale required. This Project will allow Rwanda to implement its NDC commitments and pursue its aspirations under its National Forest Policy and Climate Resilient Green Economy plans for reversing trends of high deforestation, allowing for demonstration of sustainable reforestation models and reductions in demand for wood fuel. Rwanda has made an impressive commitment to using forests and forest protection as part of its strategy to mitigate the impacts from climate change, and to provide benefits of biodiversity conservation and livelihood improvements.

Yet, vulnerable citizens' needs, coupled with fragile landscape and forest restoration, will not be met solely with national resources in the rapid timeframe needed to arrest loss of economic assets for households and prevent further degradation of landscapes. Specific investments in awareness and forest governance, training at scale required to increase the resilience of CND communities to the impacts of climate change, and alignment and coordination of support on undertaking climate resilient restoration activities are not currently being developed by the GoR. The GoR does not have the financial means to implement all project activities identified to improve climate resilience and requires technical assistance and support. While project partners are contributing co-finance for this project implementation, this represents only a fraction of the resources required for implementation. The GCF grant investment can help initiate, expedite, and catalyze these critical interventions and assist with alignment of future climate resilience efforts. MoE is requesting grant funding for this Project due to Rwanda's status as an LDC, insufficient alternative finance options, and because the proposed activities will provide a public good on which the livelihoods of many of Rwanda's rural poor depend. The high levels of poverty among project beneficiaries in the CND as identified in the Feasibility Report necessitate the use of grant funds rather than a reimbursable financial option. While the GoR will contribute resources for the implementation and sustaining climate resilience efforts beyond the 5-year Project, this represents only a partial share of implementation resources. The GCF funding will crowd in additional private sector capital, such as efficient cookstoves and forest plantations, and will allow the government to cost-efficiently implement the adaptation capacity-building training and practices to ensure that CND landscape is restored, and climate resilient landscapes maintained.

114 "World Bank Group. 2019. *Rwanda Systematic Country Diagnostic.* World Bank, Washington, DC. World Bank. https://openknowledge.worldbank.org/handle/10986/32113 License: CC BY 3.0 IGO."

115 World Bank Group. 2022. *Rwanda Country Climate and Development Report*. CCDR Series;. World Bank, Washington, DC. World Bank Group. https://openknowledge.worldbank.org/handle/10986/38067 License: CC BY-NC-ND 3.0 IGO.

116 United Nations Department of Economic and Social Affairs, 2021. Least Developed Country Category: Rwanda Profile.

The lack of private capital structure, prevalence of subsistence farming, and inadequate market for agriculture and forested products, is the primary cause of the request for grants, not loans as little surplus products are produced and traded, and thus will be inadequate to secure or service any loans.The prevailing market conditions necessitate GCF grant finance, rather than loans, to raise the capacity and bridge the financial and technical gaps until the restoration and value chain models are brought to financially viability that can be sustained by private sector. Furthermore, our Economic and Financial Analysis (EFA) shows that the direct returns on investment in landscape restoration activities are too low to make them financially attractive or feasible for farmers, even if they had access to credit. Without GCF support, lack of private financing, large payback period, uncertainty and transaction cost of getting the loan, and upfront cost and benefits realized over a longer period of time reduces the financial attractiveness of climate resilience investments. It is unlikely that there will be a financial return on investment within the Project time frame to repay loans. The issue of societal benefit investment is accentuated by the fact that there cannot be direct uptake of benefits to communities from restoration within National Parks.

Serving low-income households yields low returns and the community lacks financial education and capacity to link them to formal private institutions. Most formal financial institutions view these as high risk and high cost, as the transactions are often small and the clients usually have neither physical collateral nor the education needed to organize their finances. Without the value chain development for potential revenue generating streams such as honey, tea plantation tourism, and efficient cookstoves, the private sector investments are not occurring. Henceforth, these potential revenue generating streams proposed in the project are not sustainable on their own and the GCF grant will not only provide financing support but will be critical in creating enabling opportunities for market development beyond the project to catalyze private investments. The full concessionality funded by GCF grants is requested so that an enabling environment can be created, and the project can overcome affordability challenges through developing a system of community co-guarantee. This will also go beyond the neoclassical economics model and focus on shifts in social dynamics that move the community as a whole to escape the poverty trap and increase financial resilience. The full concessionality for potential revenue generating streams will be passed on to end beneficiaries in the CND and the project will strengthen the capacity of community organizations on quality improvement and aggregation capacity, create market linkage with off-takers or buyers, and attract finance for development, marketing, and distribution.

Planting indigenous species, well-suited to the climatic conditions of the CND, is likely to increase the health and resilience of forest plantations and thus the erosion control benefits that these forests provide. However, when establishing protective forests, most existing projects in the CND use exotic species because they are fast growing, widely available, and low cost[117]. GCF grant resources are required to support restoration to help build natural capital (restored forest) which can be used sustainably and provide larger ecosystem benefits in the future.

The financial Net Present Value (NPV) of $34.48 million for agroforestry, $2.98 million for protective forests, and $0.31 million for silvopasture intervention and economic NPV of $58.93 million for agroforestry, $30.22 million for protective forests, $0.97 million for silvopasture, and $10.59 million for energy efficient cookstoves interventions for 20-year analysis period when GCF support for the Project is considered[118]. These results are indicative of the investment in time and resources required to increase climate resilience, associated benefits, and restoration of landscape and forest productivity. Furthermore,

117 Mukuralinda, A., et al, 2016. *Taking to Scale Tree-Based Systems in Rwanda to Enhance Food Security, Restore Degraded Land, Improve Resilience to Climate Change and Sequester Carbon.* PROFOR, Washington D.C.

118 The provision of energy efficient cookstoves is a non-income generating intervention and is expected to have no financial cash inflows and no income generating opportunities, then no financial analyses is needed. The cookstoves analyses was pursued only at the economic analysis level.

agroforestry, restoration, and forest management require up-front investments that take 10-30 years to mature fully. However, these future benefits are depressed by the use of a high discount rate that downplays the importance of long-term investments. The discount rate considered in our economic analysis is 13%, which is Rwanda Central Bank's yield for a 20-year treasury bond, as issued in August 2021. This is the rate at which the government can borrow to fund equivalent investments in the absence of grant financing. For financial analysis, we used the discount rate of 15.44%, which is Rwanda Central Bank's lending rate for July 2021. Consequently, the GoR seeks maximum concessionality from the GCF for the urgent adaptation actions proposed under this Project. Without GCF funding, under a business as usual (BAU) scenario, inadequate technical and financial capacity at the national and local level will continue to hinder the efforts of rural communities in the CND to adapt their livelihoods. Consequently, the vicious negative cycle of unsustainable forest use and ecosystem degradation will persist, reducing the supply of goods and services which buffer impacts of climate change on rural communities, compounding their vulnerability. GCF funding is therefore vital to initiate progress towards a complete paradigm shift in GoR's approach to adapting the livelihoods of rural Rwandans to climate change.

The Project cost per direct beneficiary of $31 ($39.86 with co-funding) and 20-year economic rate of return of project interventions for agroforestry (49%), protective forests (72%), and silvopasture (51%) highlights its viability. The Economic rate of return for energy efficient cookstoves could not be estimated as there is no change in the sign in the net cash or resource flows from positive to negative over the analytical period; and the economic NPV of $10,585.675 for this intervention highlights its feasibility. The cost of restoring natural forest for providing both adaptation and mitigation benefits is significantly greater than the cost of simply planting trees for mitigation. Restoration of natural forest in Rwanda is essential for sustaining the critical ecosystem services on which vulnerable rural communities and the national economy depend. The capital market in the country is weak and provides limited opportunities. It has low levels of direct investment which further limits the opportunity for financing. The country's capital markets currently are not able to serve the needs of rural and resource limited beneficiaries. The project addresses market failures and minimizes the risk of disrupting or unduly distorting markets or crowding out private finance, including new entrants, as well as other public investments. Taking the above-mentioned points into account the concessionality that the GCF provides is justified.

B.6. Exit strategy

The Project will establish a new inter-agency and local-to-national-scale spatial planning framework and capacity for an integrated approach to multi-sector analysis and planning. This will enable the analysis of land-use trade-offs that explicitly consider the value of ecosystem services, climate risks and risks of ecosystem degradation. This represents a radical shift away from business-as-usual and will have long-term, far-reaching implications for policy and financial planning in Rwanda. It will provide a spatially explicit framework for mainstreaming climate risk considerations across all sectors while also providing a mechanism for quantifying harmful financial flows to biodiversity from multiple sectors.

In addition, the multi-scale spatial planning system will be able to strengthen and link directly to the system under development by Rwanda's Ministry of Finance and Economic Planning (MINECOFIN) for policy coordination to integrate climate risks into fiscal planning, with support from the IMF Resilience and Sustainability Trust. Further, it will support the ability of both national and local governments to plan and implement the new disaster risk reduction strategy in a spatially explicit way, which previously has not been possible.

Mainstreaming climate change adaptation metrics. The Project will integrate climate resilience metrics into land use planning, district development strategies and annual performance contracts and harmonize cross-

sectoral monitoring and reporting mechanisms. This will lead to a systematic consideration of climate change risks and adaptation in policy planning that will be sustained beyond the Project. An MoU between key government agencies will operationalize the cross-sectoral planning task force, which will be supported by a ministerial order, giving it the mandate and financial support to operate beyond the life of the Project.

Rwanda has adopted a private-public partnership (PPP) business model to make its national parks operations financially viable. However, in Rwanda, as in the rest of the world, national parks and the biodiversity they are intended to protect are threatened by climate change and by the interaction of climate change with other direct anthropogenic threats. By "climate proofing" its national parks–i.e., by establishing a technical unit within RDB, by explicitly incorporating climate change considerations into the management plans of national parks, including climate-wise functional linkages, such as the one this project will create in the CND, and by training rangers and other park personnel to proactively manage climate-change-related threats–Rwanda will ensure that the ecosystem service benefits of the country's biodiversity, including its national parks, will be sustained beyond the life of the Project. Specific finance instruments–such as payment for ecosystem services (PES) and structured impact conservation bonds to ensure ongoing revenues and benefit-sharing with surrounding communities–will be identified and implemented before the end of the project, in a manner consistent with the Biodiversity Finance Plan that the GoR has recently developed with support from BIOFIN. The Project through RFA will hire a Technical Advisor , to work with RDB, MoE, REMA, FONERWA and MINECOFIN to ensure that a portfolio of sustainable finance mechanisms is designed and implemented before the end of the project period to ensure the long-term sustainability of the Project outputs.

Strategies for Long-term Financial Sustainability. Two specific examples of the Government of Rwanda's commitment and approaches to financial sustainability that will be key parts of the Exit Strategy are the Tourism Revenue Sharing Program (TRSP) of RDB and the Community Adaptation Fund of FONERWA, the Rwanda Green Fund.

Tourism Revenue Sharing Program. The long-term success of the three protected areas in the CND depends, to a substantial extent, on the support of communities living around protected areas. In recognition of this, in 2005 Rwanda established a Tourism Revenue Sharing Program, allocating 5% of gross tourism revenue to local communities. Currently Rwanda and Uganda are the only two African countries with formal tourism benefit sharing programs. RDB recently completed a 15-year review of its Tourism Revenue Sharing Program (Snyman et al. 2023) and it has increased the revenue sharing allocation from 5% to 10%.

The primary challenges identified in the 15-year review are increasing the effectiveness of community engagement, reaching the most vulnerable community members, and ensuring that the TRSP meets community needs. The GoR is interested in adapting the TRS Policy to more effectively engage the communities living around the PAs in the TRSP and to allocate more funding to directly enhance the lives of Rwandan citizens living around PAs. In this regard the Project will work with RDB and district governments, to increase transparency in the Program, ensure that the most vulnerable community members benefit from the TRSP and to link the cooperatives and youth-led SMEs to the Program. This will include working with RDB to use the insights from this project to revise the TRSP revenue allocation model and eligibility to create greater resilience among communities. The 15-year review recommended that the following percentages be used for the revenue allocation going forward: 70% for livelihood projects; 25% for infrastructure support; and 5% in an emergency fund. However, there is a need for input from this Project to ensure that the specific types of projects to be supported most effectively increase community resilience. This will ensure long-term benefits to communities.

The Community Adaptation Facility (CAF) within FONERWA was developed as part of Rwanda's NDC Deep Dive: Advancing Financial Innovation to Scale Up Climate Action. The aim of the CAF is to provide grant

funding for community projects that scale up climate resilience. In this regard, the Project will support the cooperatives and youth-led SMEs engaged in Component 3 to prepare business plans and link them to innovative financing for community projects with the CAF. In line with the CAF priorities, the business plans will focus on the investment priorities of the Rwanda Green Fund (FONERWA) targeting conservation and sustainable management of natural resources especially ecosystem rehabilitation, sustainable land management, sustainable forest management and promotion and protection of biodiversity. The Project Technical Assistance will work with FONERWA to design specific long-term funding opportunities for communities in the CND to the CAF.

Additionally, the Project will enhance the environmental, social and economic resilience of communities in the CND by enhancing financial and accounting literacy, marketing and entrepreneurship, and vocational skills of community members (e.g., in native tree propagation, forest restoration, and fuel-efficient stove production). This will mean the Project will invest in businesses that restore or indirectly halt the degradation and loss of native forests by reducing or eliminating local stressors. These businesses and projects are expected to live beyond the lifetime of the project. The value chains, once organized profitably, can continue to grow without further support, while the financial service providers will continue to service savings groups and farmers and SMEs in the value chain with sustainable financial services also after the project ends. By raising the productivity from selected crops, diversifying agriculture towards high-value agriproducts, and strengthening their value chains through trainings in marketing, processing and business, the project will attract investments from the private sector in sustainable agriculture and agroforestry. All economic and environmental benefits from the project will be rigorously monitored, captured, compiled and disseminated as knowledge products, packaged for various stakeholders including investors and MFI, with which the project will engage to secure microcredits to beneficiary farmers.

(c) FINANCING INFORMATION

C.1. Total financing

(a) Requested GCF funding	Total amount	Currency
	39,056,421	USD ($)

GCF financial instrument	Amount	Tenor	Grace period	Pricing
Grants	39,056,421	-	-	-

(b) Co-financing information	Total amount	Currency
	10,943,579	USD ($)

Name of institution	Financial instrument	Amount	Currency	Tenor & grace	Pricing	Seniority
Rwanda Development Board	Grant	5,000,000	USD ($)	-	-	-
Rwanda Forestry Authority	Grant	831,307	USD ($)	-	-	-
Rwanda Water Resources Board	Grant	5,000,000	USD ($)	-	-	-
Ministry of Environment	In-kind	112,272	USD ($)	-	-	-

(c) Total financing (c) = (a)+(b)	Amount	Currency
	50,000,000	USD ($)

(d) Other financing arrangements and contributions

The Government of Rwanda is providing grant financing via the Rwanda Forest Authority (RFA), Rwanda Water Board (RWB), and Rwanda Development Board (RDB) to support activities in component 3. In addition to their contributions, AE will cover office costs in the form of an in-kind contribution equivalent to $112,271 for the Project Management Unit which will be hosted within AE premises. The co-financiers have been identified based on their existing mandates and activities they implement in the CND region hence this was the only assessment done and they have been able to commit their involvement in the project implementation. The provided co-financing commitments will serve as a basis of MoE engagement during the project implementation. During implementation of the project, annual work plans will be adjusted together with the executing entity and all the co-financiers to align with everyone's activities. MoE/AE under its oversight role will ensure that all these stakeholders commit during planning on their co-financing and report on it during Annual Performance Reports submitted to GCF.

C.2. Financing by component

Component	Output	Indicative cost USD ($)	GCF financing		Co-financing		
			Amount USD ($)	Financial Instrument	Amount USD ($)	Financial Instrument	Name of Institutions
Component 1: Mainstreaming Climate adaptation into integrated land use planning	1.1 Landscape-wide land-use plan developed for climate-resilient livelihoods & forest ecosystems, integrating district strategies	1,729,172	1,729,172	Grant			
	1.2 Local & national institutional capacities strengthened to integrate biodiversity & climate risks into land use planning & management	1,195,652	1,195,652	Grant			
Component	**Output**	**Indicative cost USD ($)**	**GCF financing**		**Co-financing**		
			Amount USD ($)	**Financial Instrument**	**Amount USD ($)**	**Financial Instrument**	**Name of Institutions**
Component 2: Forest and landscape management and restoration	2.1 PA management effectiveness improved re climate risks & adaptation	2,051,778	2,051,778	Grant			
	2.2 Natural forest cover restored, biodiversity connections established	16,917,145	14,271,796	Grant	2,645,349		Rwanda Water Board
Component 3: Enhancing climate adaptation through promotion of resilient livelihoods and climate-smart farming methods	3.1 Farming methods enhance productivity, reduce erosion & flooding risks, contribute to ecosystem services, and support connectivity	13,451,014	10,856,387	Grant	478,071 2,116,556	Grant Grant	Rwanda Forestry Authority Rwanda Water Board
	3.2 Rural livelihoods generate alternative incomes & reduce pressure on forests	8,612,188	3,850,283	Grant	4,761,905	Grant	Rwanda Development Board
	3.3 Financial services & private sector investment engage	559,890	559,890	Grant			

Monitoring & Evaluation	4.1 - Performance monitoring plan developed	555,475	555,475	Grant			
	4.2 - Project monitored and evaluated; lessons learnt integrated into adaptive management processes	645,390	645,390	Grant			
Project Management Costs	5.1 Project managed efficiently to achieve its goal to build resilience to climate change in CND	1,901,344	1,480,769	Grant	106,925 313,650	In-Kind Grant	Ministry of Environment (AE) Rwanda Forestry Authority
<u>5% Contingency</u>		2,380,952	1,859,830	Grant	39,586 238,095 238,095 5,346	Grant Grant Grant In-Kind	Rwanda Forestry Authority Rwanda Water Board Rwanda development Board Accredited Entity
Indicative total cost (USD)	**50,000,000**	**39,056,421**	**10,943,579**				

C.3 Capacity building and technology development/transfer	
C.3.1 Does GCF funding finance capacity building activities?	Yes ☒ No ☐
C.3.2. Does GCF funding finance technology development/transfer?	Yes ☒ No ☐

This project will build knowledge among land-use planning actors on the value of forests for climate resilience, and institutionalizing cross-sectoral meetings to encourage synergies and avoid overlapping

mandates and redundancy in different climate resilience interventions to ensure climate adaptation and climate resilience are explicitly incorporated into land-use planning processes in the CND, such that trade-offs between different sectors can be resolved while balancing the climate resilience of nature and people. Local land-use planning experts and community members will be trained and engaged to review and interpret the National Land Use and Development Master Plan, to ensure the plan accounts for current and future climate risks, and that these risks are also considered in district level planning schemes. The knowledge and insights gained from these activities will be synthesized and used to inform the design of an Integrated Land-use Plan for Resilient Livelihoods and Ecosystems, which will reconcile the cross-sectoral (e.g., tourism, environment, forestry, food production, cash crops for export) trade-offs necessary to sustain forest ecosystem functions, deliver critical ecosystem services and improve community livelihoods. An innovative scientifically credible system for monitoring trends in natural forest cover and forest types will also be established, and a comprehensive capacity building programme will improve use of remote sensing, ecosystem service modelling and spatial planning tools to inform decision making. **Budget: $2,000,754**

To enhance forest resilience across the CND, through a combination of increased forest cover, improved forest condition, and improved management to reduce degradation and pressure on forests, the project will increase the extent and condition of natural forest within the CND's national parks, by facilitating regeneration of large areas previously degraded by fires, securing key remaining natural areas outside PAs and developing a financial sustainability plan for the CND. The project will invest in the capacity of government agencies, districts, and communities to manage forest fires. Community members will be trained in and provided technical assistance and equipment for restoration techniques, establishment, and management of indigenous tree nurseries. Management plans for the CND's national parks will also be updated and park staff trained to explicitly consider climate adaptation and gender issues and manage the parks as part of the larger CND landscape. The project will also develop the capacity of key Government ministries and agencies on sustainable conservation finance. **Budget: 5,420,837**

Additionally, this project will strengthen the livelihoods of landless and or the most vulnerable households, who are often most at risk of unsustainable use of their farmlands, protected areas and resources within protective forests. Erosion control measures and on-farm tree cover will be increased across the CND, helping reduce the risk of crop failure from extreme events like landslides, reduce land and water degradation caused by soil erosion, and increase provision of valuable products like wood fuel. To decrease pressure on forests for resource extraction, existing successful programs distributing improved cookstoves will be dramatically scaled up. Community members will be trained in and provided technical assistance for SLM practices, establishment, and management protective forests. Both cooperatives, individuals, participating financial institutions (PFIs), and value chain actors/small and mid-size enterprises (SMEs) will benefit from capacity-building to improve their business skills and access to finance, and to strengthen value chains (including beekeeping, ecotourism, agri value chains, and cookstoves), including the construction of processing facilities and marketing materials. Vocational training schools and local youth cooperatives will be supported to produce, test, and distribute Tier 2 cookstoves. **Budget: 13,893,987**

(d) EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

D.1. Impact potential

Adaptation Impact – This Project is designed to restore, sustain and expand critical forest ecosystem functions in the CND. More specifically, the project will protect, restore and expand natural forest in and around the core national parks; consolidate and expand some smaller but critical "stepping stones" of remaining natural habitat between these national parks (mainly small forest patches and wetlands/ riparian areas); improve the landscape linkage function of key high altitude between the protected areas, while at the same time securing ecosystem services through afforestation and improved native species mix for plantation forests on steep slopes; silvopastoral interventions on cultivated pasture; and agroforestry interventions in regenerative agricultural areas. These interventions will reduce erosion, decrease loss of soil organic matter, and thus increase the water infiltration rate, which increases water recharge which will enhance the resilience of forest ecosystems and smallholder farmers to climate change. The establishment of ecological connectivity between fragmented forests will promote landscape heterogeneity and support species migration to more favorable conditions within this human modified landscape and as a result help build the resilience of biodiversity to climate impacts. Increasing the capacity for species movement across these islands of forest habitat, will improve the adaptive capacity of multiple species that serve as important seed dispersers and insure the long-term viability of forests.

Project interventions will include 10,000 ha of land (including both forest and silvopastoral sites) under improved, climate-resilient management; and improve agroforestry practices on 3,346 ha of on-farm plantations, directly benefiting 1,254,242 people (654,404 women) with more climate resilient livelihoods from reduced exposure to landslides, floods and soil erosion and more knowledge on climate risks, value of forests and forests ecosystems, climate adaptation options, access to indigenous and agroforestry quality materials and improved ecosystem services.

The Project will provide direct benefits to increase the climate resilience of more than 1.5 million of the most vulnerable residents of the CND, including increased adaptive capacity through reduced exposure to flash floods, landslides, and soil erosion which will also increase their crop productivity and livelihoods (direct beneficiaries 52.2% female). Indirectly, 2,464,097 beneficiaries in the CND will receive co-benefits from improved and more sustained ecosystem services, including decreased sedimentation leading to improved water quality downstream and increased hydropower generation. This helps Rwanda produce cleaner hydropower energy at a lower cost, making it preferable to other more detrimental energy sources. The project will also indirectly benefit 9,260,745 people and create approximately 24,212 job opportunities in forest-dependent communities.

The Project will contribute altogether to the restoration of 5,000 ha of intact forest, 2,500 ha of protective forests and 3,346 ha of smallholder farmland, 1000 ha of pastures and 1,500 ha of riparian linkages. Overall, 275,617 ha of the landscape could potentially be positively impacted by the project as land use planning, improved natural forest management, improved buffer management and a stronger agroforestry sector would all contribute to improved outcomes beyond the specific areas directly targeted for restoration or improved management by the project. In particular, stronger capacity for land use planning across the CND and hence improved protection of key areas (e.g. steep slopes, riparian areas and protected area buffers) has strong potential to deliver significant mitigation benefits at a landscape rather than a site level. Although the project is focused on the priority landscapes covering 275,617 ha, it is likely that benefits due to increased adaptive capacity (achieved through improved land use planning and management of key features through

reduced exposure to flash floods, landslides, and soil erosion) could feasibly extend across the full 700,000 ha CND.

Additional adaptation benefits will include the training of 52,589 community members in forest management and restoration for climate resilience, which will be linked with ongoing restoration employment opportunities through other GoR and private sector projects; the strengthening of institutional and regulatory systems to promote climate resilience; and targeted capacity building for certain government institutions and ministries in forest monitoring, remote sensing, spatial planning, and analysis. These beneficiaries will include MoE, REMA, RDB, MINAGRI, and the University of Rwanda.

Complementary activities will address key drivers of deforestation while creating alternative livelihood pathways for youth and women through ecotourism and income-generating, climate-resilient crops, as well as strengthening supportive financial services.

Mitigation Impact – The Project will generate mitigation benefits by delivering sequestration of approximately 224,871 t CO_2-eq during the 5-year Project period, which is about 0.8% of the 28.2M t CO_2 reduction targeted by Rwanda's vision 2050.

- 5,000 ha of critical intact natural forests will be under improved management for climate resilience, accounting for an estimated total of 596,116t CO_2-eq over 20 years.
- 1,000 ha of pasture lands with increased coverage of native trees to secure reasonable landscape connectivity for forest species, accounting for an estimated total of 4,543t CO_2-eq over 20 years.
- 1,500 ha of riparian lands will be afforested which will contribute significantly to overall landscape connectivity, sequestering 110,138 t CO_2-eq over 20 years.
- 2,500 ha of protective forests and plantations will be established on slopes >55%, focusing on areas not currently planted in crops, accounting for an estimated total of 193,472 t CO_2-eq over 20 years.
- Erosion control and agroforestry practices will be implemented over 3,346 ha of smallholder farmland, sequestering 129,006t CO_2-eq over 20 years.
- Improved energy efficient stoves will be adopted by 8,500 households, securing 51,017t CO_2-eq of avoided emissions over 20 years.

Overall, there is potential for a significant contribution to GCF1 Core Indicator 4, hectares of natural resource areas brought under low emission or climate resilient practices. Conservatively, an area of 275,617 ha of the landscape could potentially be positively impacted by the project as land use planning, improved natural forest management, improved buffer management and a stronger agroforestry sector would all contribute to improved outcomes beyond the specific areas directly targeted for restoration or improved management by the project.

D.2. Paradigm shift potential

As described in Section B1, the Project provides a profound opportunity to implement new mechanisms of land-use planning and management that are based on consideration of the CND as a landscape, consisting of an inter-dependent mosaic of forests and farms, the management of each determining the health of the whole. Focusing on this larger scale, with coordination across both geographic and sectoral boundaries, while mainstreaming climate risks into management planning represents a fundamental paradigm shift for land-use planning and management in Rwanda. This approach to land-use planning and management is entirely new for Rwanda and is intended to maintain and recover the ecosystem services that are essential to the resilience of smallholder farming communities within the region and to the globally significant and

unique biodiversity in this part of Rwanda. This represents a reversal of the previous negative feedback loop of ecosystem degradation to a more positive, climate-resilient system.

Potential for scaling-up spatial planning and replication. Spatial planning is recognized by the IPCC, the EU and others as playing a key role in climate change adaptation and climate resilient development, but to date development planning in Rwanda has largely been based on tabular data, rather than on spatial planning. Adoption of spatial planning across ministries and on national regional and local levels, represents a significant paradigm shift for Rwanda. Piecemeal decisions and an ad hoc assemblage of isolated sector-by-sector projects will be replaced with a holistic, climate-smart, evidence-based approach to planning and development – enabling systematic, ecosystem-based, multi-sector analysis of land use tradeoffs. The Project will therefore establish a new inter-agency and local-national model and capacities for holistic planning and implementation – one that can be scaled up for use elsewhere in Rwanda and beyond. This will enable better-informed planning decisions, the identification and valuation of nature-based solutions to climate adaptation and mitigation, and overall will foster climate resilient development pathways in the CND and nationwide. Communication and collaboration with complementary GCF and other projects in Rwanda will accelerate this process.

Potential for knowledge and learning. Component 1 will invest in new technologies and climate-smart knowledge to improve national and district planning, scenario analysis and monitoring capacities. In doing so, new mechanisms of coordination and collaboration will be established, and shared across agencies. Component 2 will invest in best practices in forest management and restoration – some of which will require learning beyond the existing science of indigenous tree propagation and restoration (particularly in re-establishing rain forest habitat, establishing protective forests on slopes of >55%, and enriching farms with indigenous tree species). Component 3 will focus on processes to identify and pilot value-chain products (on-farm and off-farm) not yet in practice. All approaches will include the participation of local farmers, women, and youth to contribute to collective learning processes involving national and local government and vulnerable communities. Knowledge generated – and the processes by which it is generated – will be shared across the region. The project is based on collective learning, knowledge generation and dissemination at community, landscape and national levels. A focus on knowledge management through demonstrations, monitoring, and evaluation across the project activities will inform the implementation of current and future adaptation efforts.

Contribution to the creation of an enabling environment. Strengthening the Task Force in Component 1 will ensure a single, first point of contact for all sectors' planning development and investments in the CND and will ensure that planning for climate resilience is addressed. By establishing a mechanism for coordination and harmonization, it will radically improve current conditions for public and private interventions and will establish partnerships and collaborations that live beyond this Project. Also importantly, promotion of sustainable financing for each component will help to assure that initiatives will either be self-sustaining or have solid plans for continued financial support.

Contribution to the regulatory framework and policies. The Project will finance the development of the *Integrated Land-use Plan* which will be adopted by all ten CND districts as a framework for seeking synergies between rural livelihoods and forest and biodiversity protections, reconciling land use conflicts that arise, and guiding development decisions and climate change adaptation. It will update the National Land Use Master Plan, ensuring it incorporates climate resiliency, and is accurate and relevant to local contexts. As development of an Integrated Land-use Planning approach helps better reconcile cross-sectoral tradeoffs and improve climate adaptation planning in the CND, this approach will prove a successful model for application to other regions of Rwanda and to other forest/farming landscapes beyond. In addition,

revising 2 NP management plans to include climate concerns will serve as a model for the remaining parks of Rwanda, as well as for the East African region.

D.3. Sustainable development (max. 500 words, approximately 1 page)

The proposed Project is aligned with the United Nations 2030 Agenda for Sustainable Development, including SDGs 5, 13 and 15 and will contribute to the achievement of the SDGs 1, 2, 3, 5 and 10. The Project will promote an ecosystem-based approach to forest protection, restoration, and rehabilitation that includes:

- Reduction of erosion, sedimentation, and landslide risk as a result of restoration of degraded lands;
- Increased number of native trees on farms with improved agroforestry systems, improving biological connectivity;
- Increased carbon sequestration potential of plants and soils. While the primary objective of the Project is adaptation, the Project will also produce mitigation benefits of 204,079t CO_2-eq during the 5-year implementation period, and 1,033,275t CO_2-eq over the 20-year Project lifetime.
- Reduced GHG emissions through more fuel efficient cookstove technologies, yielding cumulative savings of approximately 51,017t CO_2-eq during the 20-year Project lifetime.

The Project will enable the transition to more climate resilient and productive livelihood models and empower the rural poor, significantly reducing impacts from extreme weather events and increasing their potential for improved wellbeing. Social benefits will include:

- Raised awareness about climate change effects and adaptation in 1,253,252 people living in the CND (at least 52.2% representing women).
- Capacity building of ~52,589 people (at least 50% women), in a wide range of topics aimed at increasing ecosystem and social resilience.
- Create significant social capital through co-designing and co-managing a range of adaptation strategies, indirectly promoting social cohesiveness among CND villages through joint saving and lending systems.
- Reduced inequality and poverty through increased financial inclusion and improved economic opportunities — especially for women, youth and historically marginalized groups.
- Forest and landscape restoration in the CND will have several economic co-benefits for vulnerable communities, including:
- Soil erosion control measures, protective forests on public lands and agroforestry on private lands, will increase agricultural productivity and associated income.
- The Project will create direct and indirect employment opportunities, benefiting approximately 24,212 households and stimulate the local economy.
- Leveraging private capital to invest in the value chains including cookstoves in the CND. The project will create important social and environmental benefits. However, the project will also have removed a number of risks (notably carbon risk) that worry more traditional (social-impact or sustainability) investors. As a result, the venture becomes an attractive investment for private capital interested in a “triple bottom line”, allowing the business to develop sustainably and scale to more CND areas. During project implementation we will therefore produce a bankable business plan that details the activities and resources required for expanding further.

The Project will result in positive outcomes around access to resources, improved livelihoods, and income generation opportunity and capacity for women. With support from a dedicated Gender Specialist, the Project will engage women in project planning, investment and decision making. With opportunities to generate additional income, women, who traditionally are already further vested in investing in their families, will be more able to respond to incentives that address their families' basic needs, such as better health and nutrition, linking to agriculture and food security improvements. The project will also get support from NGOs that engage men in programming and discussions to increase their participation in household and parental responsibilities and gain greater awareness of the importance of women's fair access and control of resources, including income. Women will benefit from training and educational activities, leadership, entrepreneurship and decision making. Annex 8, which will be further elaborated on at project onset, provides more information on gender-sensitive impacts.

D.4. Needs of recipient

Despite Rwanda's solid economic progress since 2000, poverty remains widespread and pervasive. Overall, 38.2% of the population lives in poverty and 16% in extreme poverty[119]. Women are more affected by poverty than men, with 47% of female-headed households living in poverty compared with 44.9% of all households. Rural households are more than twice as likely to be in poverty/extreme poverty than urban households. Districts of the Western and Southern Provinces in the CND region have the highest rates of poverty and extreme poverty in the country.

Most rural households are smallholder subsistence farmers and, because of high population density, high relief terrain and dependence on rain fed agriculture, the residents of the CND are highly vulnerable to climate change. These risks include exposure to flash floods[120], landslides[121] and soil erosion[122]. During stakeholder consultations, communities indicated several socio-economic changes stemming from changing climate conditions. Notably, the longer dry season and unpredictable rains[123] have reduced agricultural yield significantly, leading to more widespread malnutrition and extreme poverty, and farmers can barely meet their own families' needs[124]. In particular, women, youth, and historically marginalized people are feeling the impacts. As arable land is increasingly constrained, youth and historically marginalized people have few opportunities and are more focused on survival and short-term gains at the expense of education and sustainable livelihood development (see Annexes 6 and 8 for more detail).

As a result, the GoR has invested significantly in developing an enabling policy and institutional framework for a more climate-resilient development pathway. Yet, while adaptation is a top priority, Rwanda is classified by the U.N. as a LDC and lacks sufficient public financial resources to implement its climate change and resilient green development objectives. Currently there are no alternative funding options of the scale needed to secure Rwanda's priority forests to reduce vulnerability of rural communities to climate risks. The GoR also recognises that a piecemeal approach to decision making has exacerbated competition over scarce land resources and reduced the adaptive capacity of both ecosystems and rural populations. However, many

119 World Bank, 2020. *Poverty and Equity Brief: Rwanda.*

120 Karamage, F., et al., 2017. *Modeling Rainfall-Runoff Response to Land Use and Land Cover Change in Rwanda (1990–2016)*. Water 2017, 9(2), 14.

121 Uwihirwe, J., et al., 2020. *Landslide precipitation thresholds in Rwanda*. Landslides.

122 World Bank, 2019. *Rwanda Systematic Country Diagnostic.*

123 World Bank; CIAT. 2015. *Climate-Smart Agriculture in Rwanda.* CSA Country Profiles for Africa, Asia, and Latin America and the Caribbean Series. Washington D.C.: The World Bank Group.

124 Clay N., King B., 2019. *Smallholders' uneven capacities to adapt to climate change amid Africa's 'green revolution': Case study of Rwanda's crop intensification program*. World Dev.

agencies operate within siloed environments, focusing on limited scopes framed by individual performance plans, and close coordination is often cited as a key recommendation toward strengthening climate change adaptation measures[125].

Additionally, district government staff and community members have limited technical understanding or awareness of the complex interactions between forest structure and functions, climate change, and the provision of ecosystem services. Accurate measurement of forest cover and forest type is notoriously difficult in high relief terrain, such as in the CND[126]. Lack of access to and capacity to apply new methods for classifying and monitoring forest change has limited forest monitoring in Rwanda[127]. Consequently, government forest data has historically been limited in scope and infrequently updated, and regional/global maps are too inaccurate to be of use. Capacity building around the technologies and processes to make landscape-scale planning decisions is crucial to the success of Rwanda's climate-resilient development pathway.

D.5. Country ownership

The proposed Project is closely aligned with the NAP's adaptation priorities: 1) promotion of non-agricultural income generating activities, 2) introduction of species resistant to environmental conditions, and 3) development of firewood alternative sources of energy. It is also aligned with several priorities identified in the 2020 NDC: promotion of afforestation/reforestation, improvement of forest management, integrated approach to planning and monitoring for sustainable land management, development of a harmonized and integrated spatial data management system for sustainable land use management. The Project will support implementation of the Green Growth and Climate Resilient Strategy and the Rwanda National Strategy for Transformation–NST1 (2017-2022) and is aligned with the goals of the Rwanda National Forestry Policy 2018, the Forest Sector Strategic Plan 2017-2022, the Strategic Plan for the Environment and Natural Resources Sector (2018-2024), and National Forest Management Plan 2017-2026, reflecting the government's intentions to address climate change impacts and mitigation targets by improving forest management. It is also aligned with the national Biomass Energy Strategy (BEST) 2020 which aims to ensure a more sustainable biomass supply and combustion technologies for homes and small enterprises. This Project aligns with the forthcoming GCF country program which prioritizes forest management through restoration and protection of natural forests, afforestation and agroforestry, as well as distribution of high-quality forestation inputs and capacity development.

While this Project proposal to GCF focuses on a different geographic area - with specific adaptation needs through land restoration, development of markets and finance mechanism, as well as support to mainstreaming climate change into land use planning - the early and ongoing lessons from the experiences from existing GCF-funded projects, "Strengthening Climate Resilience of Rural Communities in Northern Rwanda"[128] and "Transforming Eastern Province through adaptation" (TREPA)[129] will be applied during the

125 Bagstad, K.J., 2019. *Towards ecosystem accounts for Rwanda: Tracking 25 years of change in flows and potential supply of ecosystem services.* British Ecological Society.

126 Arakwiye, B., et al, 2021. *Thirty years of forest-cover change in Western Rwanda during periods of wars and environmental policy shifts.* Regional Environmental Change 21(2).

127 Herold, M., Schiller, F., 2009. *An assessment of national forest monitoring capabilities in tropical non-Annex I countries: Recommendations for capacity building.* Global Observation of Forest and Land Cover Dynamics Land Cover Project Office.

128 Rwanda Ministry of Environment, 2018. *FP073: Strengthening Climate Resilience of Rural Communities in Northern Rwanda*. Green Climate Fund.

129 International Union for Conservation of Nature, 2021. *FP167: Transforming Eastern Province through Adaptation.* Green Climate Fund.

implementation of this Project in the Congo Nile Divide Landscape.

MoE is responsible for ensuring sustainable management of natural resources and for the development of policies, strategies, regulations, and mobilizing resources for the development of the sector. The MoE managed USD 10 million from the Adaptation Fund to implement the Reducing Vulnerability to Climate Change in North West Rwanda through Community Based Adaptation Programme[130] and has overseen a number of other climate projects including: an early warning system project (funded by LDCF), the Landscape Approach to Forest Restoration and Conservation (LAFREC), and the "Building resilience of communities living in degraded forests, savannahs and wetlands of Rwanda through an ecosystem management approach" programme (funded by LDCF)[131]. The OECD rated Rwanda as one of the countries that uses aid most effectively[132], and Rwanda is on course to achieve the SDGs. The GoR has demonstrated comprehensive country ownership of, and capacity to implement, a funded project. The national designated authority (NDA) is the core interface between a country and the GCF and is mandated to align GCF-supported activities with strategic national objectives and priorities. The NDA coordinates with AEs on proposal development and completes a no-objection letter after it is determined that the proposal is aligned with the national priorities. This Project was initiated by the MoE and supported by the NDA, Rwanda Environment Management Authority, due to the high climate sensitivity of the CND.

Government agencies such as Rwanda Forestry Authority (RFA), Rwanda Development Board (RDB), Rwanda Environment Management Authority (REMA) and National Land Use Authority (NLA) will maintain strong ownership and support activities under component 1 and 2 as aligned with their mandates and the aforementioned plans and strategies.

To better understand the interests of stakeholders and potential impacts of the Project, and as preparation to design future engagement strategies, a comprehensive, gender-responsive, culturally sensitive, non-discriminatory, and inclusive stakeholder analysis was undertaken and is incorporated into the Stakeholder Engagement Plan (Annex 7).

D.6. Efficiency and effectiveness

Financing and concessional: The financial instrument chosen for this Project is grant financing of USD 39.06 million which constitutes roughly 78% of the total Project's estimated cost. The relatively high level of concessionality reflects the public good character of the investments to be made by the Project, Rwanda's status as an LDC[133] and its high vulnerability to climate change[134]. Furthermore, it must be highlighted that most project expenditures relate to creating public goods through forest and landscape restoration or capacity-building of public institutions. These interventions are primarily non-income-generating; hence very hard to attract private sector investment. Attracting the private sector for public goods investments remains challenging in the context of many countries worldwide, including Rwanda.

Addressing low private sector investment in the forestry sector. One of the major reasons for lack of private-sector investment in Rwanda's Forestry Sector is that most stands are too small to sustain an

130 Adaptation Fund, 2014. Reducing Vulnerability to Climate Change in North West Rwanda through Community Based Adaptation. Link.

131 UNEP, 2016. *Building resilience of communities living in degraded forests, savannahs and wetlands of Rwanda through an ecosystem management approach*.

132 Newfarmer, R., et al., 2013. *Managing Aid for Trade and Development Results: Rwanda Case Study*. OECD.

133 United Nations Department of Economic and Social Affairs, 2021. Least Developed Country Category: Rwanda Profile.

134 World Bank, 2021. *Rwanda*. Climate Change Knowledge Portal.

economically viable operation (see the Forest Sector Strategic Plan). By restoring smallholder protective forest plantations and organizing them into Private Forest Management Units (PFMUs), this Project will assist with creation of units that are economically attractive to private investors, helping to facilitate future private investment if landowners desire it. However, no private investors will be subsidized by the Project, and ownership of PFMUs will remain with the state/district governments and smallholders' cooperatives who own forest plantations. RFA in collaboration with RCA and the district government directly implement organization of the cooperatives and conflicts in the cooperatives are managed in accordance with internal rules and regulation governing each cooperative overseen by the Rwanda Cooperative Agency in case of escalated conflicts but specifically in the cooperatives that will be benefiting under this project, RFA and District government will also intervene in conflict settlement.

No excess subsidy will be provided to the private sector, and no private sector investors will be crowded out by these investments. Wherever these are required for institutional and capacity support for market development and crowding in for private investments these are undertaken with concessionality to community in mind. For example, the subsidy/microcredit schemes to facilitate the adoption of efficient cookstoves are undertaken with minimum concessionality. The value chain development for other potential revenue generating streams such as honey undertaken under output 3.2 requires institutional and capacity support funded by GCF grant. In the case of ecotourism for tea plantations, no project concessionally is planned and complete crowding in from the private sector is envisaged. The value chain development of beekeeping is 100% funded by GCF grants so that an enabling environment can be created, and the project can overcome affordability challenges through developing a system such as community co-guarantee, overcome lack of private capital structure and insufficient markets. Because of above mentioned reasons no private sector investors are expected to be crowded out by project investments.

GCF grant as a suitable financing instrument. The GCF grant can help create the enabling environment for the future engagement of the private sector in similar projects. The showcasing of potential revenue-generating ways, thanks to the concessional GCF financing, may help invigorate the potential for future investments in this sector, which in turn might result in a multiplier effect leading to a higher degree of development impact.

Results of the Economic and Financial Analysis (EFA). Following the GCF guidelines for developing the Annex 3 package, the EFA was prepared to assess the economic rationale for the proposed interventions. Consequently, four representative interventions were appraised in the EFA: (i). agroforestry, (ii). protective forests (iii). fuel-efficient cookstoves, (iv). silvo-pastoralism. Best practices in appraisal for public sector projects have been followed. The financial analysis for each intervention was calculated from the private perspective using a discount rate of 15.44% which was the lending rate of Rwanda Central Bank. For the three modeled interventions (see table below) the financial NPV is positive and financial IRR is higher than discount rate signifying that project activities are profitable. The GCF support will result in a positive financial return for farmers or farmers and private actors over a 20-year period and will help overcome high up-front investment costs during the project duration.

Financial analysis (US$)	**Agroforestry**	**Protective Forest**	**Silvopasture**
FNPV	$34,483,676	$2,980,381	$310,901
FIRR	42%	25%	35%

Aggregate financial analysis of with project (WP) interventions

The obtained ex-ante aggregate economic net present values (ENPVs) for these interventions over the 20 years' timeframe and at a 13% economic discount rate range between USD 0.97million and USD 78.93 million, with economic internal rates of return (EIRRs) between 49% and 72% (see table below).

Economic analysis (US$)	**Agroforestry**	**Protective Forest**	**Energy efficient cookstoves**	**Silvopasture**
ENPV	$58,934,340	$30,218,468	$10,585,674.50	$966,331
EIRR	49 %	72%	N/A	51 %

Aggregate financial analysis of with project (WP) interventions[135]

The sensitivity analysis that was carried out suggests that obtained results are relatively insensitive to increases in costs or decreases in benefits offering the robustness of obtained results. Therefore, the economic sustainability of the Project is likely, and the Project shows the economic rationale for implementation as benefits are likely to outweigh the costs.

Best Practices *Forest Restoration/Tree Planting*: The Project will use Rwanda's best practice guidelines for tree nursery establishment, tree planting and tree management[136]. For assisted natural regeneration, methods developed and proven through multi-year research in Nyungwe and Gishwati-Mukura National Parks will be used[137]. *Forest Monitoring:* The Project will utilize multiple contemporary methods for monitoring the success of project interventions and forest health. Forest plantations will be mapped and monitored using the Rwandan government's newly developed Forest Monitoring and Evaluation Software (FMES)[138], specifically developed for this purpose. The Project will develop a modern indigenous forest monitoring system, utilize the most high-resolution datasets currently available (<3m) and take advantage of modern remote-sensing advances including cloud computing and machine learning. Cost effective replication for forest restoration and climate resilience throughout Africa and beyond can be anticipated.

135 No financial analyses for cookstoves intervention was warranted as energy efficient cookstoves are non-income generating intervention with expectation of no financial cash inflows. Only economic analyses was conducted for cookstoves.

136 Unique Ltd. & RNRA. 2015. Tree plantation establishment and management manual for Rwanda. Kigali, Rwanda

137 Masozera, A.B., 2004. Regeneration of Burned Forested Areas With Periodic Removal of Pteridium aquilinum. Wildlife Conservation Society Rwanda.

138 Rwanda Forest Authority, Enabel, 2021. Technical guidelines on the use of the Forest Monitoring & Evaluation System - FMES. Kigali.

E. LOGICAL FRAMEWORK

E.1. Project/Programme Focus

☐ Reduced emissions (mitigation)

☒ Increased resilience (adaptation)

E.2. GCF Impact level: Paradigm shift potential

Assessment Dimension	Current state (baseline)		Potential target scenario (Description)	How the project/programme will contribute (Description)
	Description	Rating		
Scale	Rwanda's natural forests are extremely depleted and degraded. While overall forest cover has increased since the 1980s, this is primarily made up of exotic monocultures, which have very low potential to provide ecosystem services and adaptation benefits. There are small-scale efforts to establish/restore native forests and increase overall forest resilience, but scaling these efforts is hampered by a limited supply of indigenous seedlings.	Low	Paradigm shift would involve a move away from widespread planting of exotic species for fuelwood, as well as improved erosion control measures on farmland and use of improved cookstoves, both of which will reduce pressure on Rwanda's forests. As the benefits of planting indigenous trees become more widely known, behavior changes in non-targeted communities are likely to be catalyzed.	The project is expected to bring 144,058 ha of land under climate-resilient management. This would represent a substantial step towards paradigm shift on increased resilience of forests and vulnerable communities, even before any replication effects, which will likely be catalyzed by project activities focusing on training, capacity building, and peer- to-peer knowledge exchange. The project will also deliver direct carbon reductions of 1,204,448 t CO_2-eq over 20 years, and potentially more through increased institutional capacity to mainstream climate adaptation and improve land-use planning.
Replicability	There are a small number of interventions occurring across Rwanda focused on improving resilience of vulnerable communities through forest restoration, agroforestry, livelihood diversification and clean cooking technologies. However, many interventions focus on exotic species which have very low potential to provide ecosystem services and adaptation benefits.	Medium	If increasing the extent and integrity of natural forests and improving capacity for climate-responsive land management can increase climate resilience of vulnerable communities in the CND, then the solution could be replicated throughout Rwanda and across East Africa. Further, if incorporating indigenous species into forest restoration and agroforestry can provide a similar/greater range of adaptation benefits compared to exotic species, and also avoid the drawbacks of exotic monocultures, then the solution could be expanded nationally. If development of an Integrated land use planning approach helps better reconcile cross-sectoral tradeoffs and improve climate adaptation planning	The project will invest in strengthening institutional capacity to promote climate resilience, directly increase the resilience of ecosystems and community livelihoods, and identify options for use of indigenous species in forest restoration and agroforestry, in order to better contribute to climate-resilient livelihoods. These topics have received little attention to date in Rwanda, and lessons learned will inform efforts to improve climate resilience across Rwanda and East Africa.

			in the CND, this approach could be applied to other regions of Rwanda.	
Assessment Dimension	**Current state (baseline)**		**Potential target scenario (Description)**	**How the project/programme will contribute (Description)**
	Description	**Rating**		
Sustainability	The GoR has invested in developing policies and institutional frameworks for a more climate-resilient development pathway. However, domestic funding to implement these policies remains lacking, and as yet they have not translated to wide-scale improvements to climate resilience. Changes in behavioral norms have been limited, and overall uptake of climate adaptation solutions is poor.	Low	Paradigm shift would see Rwanda demonstrate that pursuing development goals need not come at the cost of extensive environmental degradation. Climate-responsive Forest and landscape management will be standard, and government programmes will focus on increasing the resilience of forest ecosystems and enhancing their ecosystem services. Behavior change across the CND would support this, as communities recognise, value, and protect the benefits provided by forests.	The project will work closely with government and communities to build capacity to mainstream climate adaptation into forest and land-use planning and management. The project will facilitate and demonstrate the benefits of climate-resilient agricultural practices, forest management, and alternative livelihoods, raising awareness within and outside target communities.

E.3. GCF Outcome level: Reduced emissions and increased resilience (IRMF core indicators 1-4, quantitative indicators)

GCF Result Area	IRMF Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
Mitigation Results Area 4: *Forests and land use*	***Core Indicator 1:*** *GHG emissions reduced, avoided or removed/ sequestered*	Greenhouse gas emission assessment	0 tonnes of CO_2	107,686 tCO_2-eq	224,871tCO_2-eq (5-year implementation period) 1,084,291tCO_2-eq (20-year lifespan period)	Government priorities remain supportive of long-term forest restoration and afforestation plans. Absence of major natural disasters including forest fires and landslides in target areas The economic, social and political context in the country and project areas remain stable.

GCF Result Area	**IRMF Indicator**	**Means of Verification (MoV)**	**Baseline**	**Target**		**Assumptions / Note**
				Mid-term	**Final**	
Adaptation Results Area 1: *Most vulnerable people and communities*	***Core Indicator 2:*** *Direct and indirect beneficiaries reached*	Annual Agricultural Survey[139] National census Project Baseline and Completion Reports, including documentation of workers contracted for reforestation/afforestation work, farmers adopting agroforestry activities, good silvo-pastoral practices, restoration of riparian linkages, signed MoUs for Private Forest Management Units, and households receiving improved cookstoves	**Direct beneficiaries**:0 **Indirect beneficiaries:** 0	**Direct beneficiaries:** 95,873 (50,046) females) **Indirect beneficiaries:** 2,809,381 (1,466,497 females)	**Direct beneficiaries:** 108,277 (56,521 females) **Indirect beneficiaries:** 2,809,381 (1,466,497 females)	Government priorities remain focused on long term forest restoration and afforestation plans Absence of major natural disasters including forest fires and landslides in target areas Rural landowners agree to adoption of agroforestry and reforestation activities
Adaptation Results Area 1: *Most vulnerable people and communities*	***Supplementary Indicator 2.1:*** *Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options*	Project Baseline and Completion Reports, including documentation of beekeepers using modern hives, farmers at different levels of value chains, people employed in ecotourism, have access to	**Direct beneficiaries**:0 **Indirect beneficiaries:** 0	**Direct beneficiaries:** 26,160 (13,656 females) **Indirect beneficiaries:**	**Direct beneficiaries:** 52,319 (27,311 females) **Indirect beneficiaries:**	

139 The National Institute of Statistics of Rwanda conducts the Agricultural Survey yearly. Available at: https://www.statistics.gov.rw/statistical-publications/subject/agriculture-and-environment

		finance for other climate-resilient livelihood options		2,809,381 (1,466,497 females)	2,809,381 (1,466,497 females)	
GCF Result Area	**IRMF Indicator**	**Means of Verification (MoV)**	**Baseline**	**Target**		**Assumptions / Note**
				Mid-term	**Final**	
Adaptation Results Area 4: *Ecosystems and ecosystem services*	***Core Indicator 4:*** *Hectares of natural resource areas brought under improved low emission and/or climate-resilient management practices*	Updated National Park Management Plans complete (ha per park) Forest cover statistics from Forest Monitoring and Evaluation System (FMES) GIS Data/Remote Sensing Ranger Based Monitoring data from PAs Vigilance Committees monitoring data	No increase in climate-resilient management practices (o)	42,558 ha of land brought under climate-resilient management	130,104 [140] ha of land brought under climate-resilient management	Absence of major natural disasters including forest fires in target areas
Adaptation Results Area 2: *Health, well-being, food and water security*	***Supplementary Indicator 2.2:*** *Beneficiaries (female/male) with improved food security*	Annual Agricultural Survey Gender responsive Comprehensive Food Security and Vulnerability and Nutrition Analysis Survey (CFSVA)[141]	TBD	**Direct beneficiaries**:0 **Indirect beneficiaries: 0**	**Direct beneficiaries**: 1,598,536 (52.2% female) **Indirect beneficiaries:** 2,464,097 (52.2% female)	Absence of extreme natural disasters and economic shocks affecting yields and household economy; migration patterns do not significantly affect the number and status of households.

[140] 130,104 ha refer to 121,758 ha of all core PAs and 8,346 ha restored areas outside PAs

[141] The National Institute of Statistics of Rwanda conducts the CFSVA every 3 years.

The level of beneficiary of this project are individual households, - who can be in a cooperative or a business community group - who will participate directly in the project, and thus benefit from its implementation. Beneficiaries include all people who own the land where activities will take place and/or those who will be employed by the project (except EE staff, consultants and implementation and contractual organizations). Dependents of household that directly benefit from the project are also considered as direct beneficiaries and were calculated based on 4.2 average household size[142] and 0.37[143] average land size in the CNDL.

Adaptation Results Area 1, Core Indicator 2 direct beneficiaries are beneficiaries of activities 2.2.2, 2.2.3, 3.1.1, 1.1.2.

Adaptation Results Area 1, Supplementary Indicator 2.1 direct beneficiaries of activity 3.2.1, 3.2.2, 3.2.4 (excluding 8, 500 beneficiaries of cookstoves) and 3.3.2

Adaptation Results Area 2 Supplementary Indicator 2.2 direct beneficiaries are the total population in landscape implementation sectors of this project.

Indirect beneficiaries broadly refer to all other human populations living within the CNDL districts. More details on calculations are provided in annex 23.

E.4. GCF Outcome level: Enabling environment (IRMF core indicators 5-8 as applicable)

Core Indicator	Baseline context (description)	Rating for current state (baseline)	Target scenario (description)	How the project will contribute	Coverage
Core Indicator 5: *Degree to which GCF investments contribute to strengthening institutional and regulatory frameworks for low-emission and climate-*	The GoR is committed to developing an enabling policy and institutional framework for a more climate-resilient development pathway, as evidenced by the large number of government policies and strategies focused on improving climate mitigation and adaptation. However, climate change is not being comprehensively considered by all sectors, cross-sectoral planning is rare, and new institutions are needed to	low	An integrated planning approach is used to reconcile cross-sectoral tradeoffs while explicitly considering climate resilience actions. New institutions have permanent capacity in place to ensure that spatial data on climate, forests and ecosystem services is incorporated into land planning and management.	The project will facilitate development of an integrated land use plan for the CND which will reconcile the cross-sectoral (e.g., tourism, environment, forestry, food production, cash crops for export) trade-offs necessary to sustain forest ecosystem functions, deliver critical ecosystem services and improve community livelihoods.	National level (one country)

142 National Institute of Statistics of Rwanda (NISR); The Fifth Rwanda Population and Housing Census, Main Indicators Report, February 2023

143 National Institute of Statistics of Rwanda (NISR), Agricultural Household Survey 2020 report, December 2021

resilient development pathways in a country-driven manner	provide relevant spatial data to inform planning			The project will facilitate the development and adoption of an integrated landscape level planning taskforce, in line with the JADF to bring the relevant stakeholders (ministries and their agencies, districts, private sector and civil society organizations) on board, to strengthen inter-sectoral collaboration on the planning and implementation of the FLR plans. The project will also support capacity development of relevant technical staff working on FLR and land use planning (from central government agencies, district government, and NGOs) and will assist the GoR in developing a dedicated SPU within an appropriate ministry to provide the technical expertise needed to process and integrate spatial planning into decision-making within and across sectors.	
Core Indicator	**Baseline context (description)**	**Rating for current state (baseline)**	**Target scenario (description)**	**How the project will contribute**	**Coverage**
Core Indicator 6: *Degree to which GCF investments contribute to technology deployment, dissemination, development or transfer, and innovation*	Climate-resilient development in Rwanda is hampered by a lack of modern technological advances, both in terms of generating information required for land-use management and decision making, and in deploying climate-resilient practices and technology. Rwanda has only recently developed a system to monitor plantation forests and lacks a robust system to monitor indigenous forests. Similarly, agricultural and forest management techniques are generally rudimentary, and most rural	low	The GoR has an innovative, scientifically credible system for monitoring indigenous forest cover and condition, as well as the technical capacity for incorporating spatial data into land-use management. Improved agricultural practices (e.g. terracing, modern beehives) are widespread, and locally produced improved cookstoves are in use by most households.	The project will design and finance the establishment of a new indigenous forest monitoring system for Rwanda. The project will also establish improved agricultural practices across 3,346 ha, as well as increasing use of modern beehives to reduce forest fire risk. Finally, the project will upskill technical colleges to enable local production and distribution of improved cookstoves to 8,500 households.	National level (one country)

	communities in the CND do not use modern cooking technologies.				
Core Indicator 8: *Degree to which GCF investments contribute to effective knowledge generation and learning processes, and use of good practices, methodologies and standards.*	While GoR recognizes the need for developing an enabling policy and institutional framework for a more climate-resilient development pathway, the value of forests and ecosystem services for climate adaptation is poorly understood, both in government and by communities. There is no system to regularly produce data on indigenous forest cover and condition, and no specialized government unit dedicated to producing spatial data on climate change, forests or ecosystem services. Agricultural and forest management practices are generally rudimentary.	low	Rwanda has an innovative, scientifically credible system for generating and sharing information on natural forest cover and condition, and a government unit dedicated to ensuring spatial planning knowledge is incorporated into land-use management. Improved agricultural practices (e.g. terracing, modern beehives) are widespread, and degraded forest plantations are restored and managed according to government best-practices.	The project will design and finance the establishment of a new indigenous forest monitoring system for Rwanda, as well as establish a spatial planning unit within government that has the capacity to generate and integrate spatial planning knowledge into decision making. Project activities will also establish best-practice agricultural and forest management practices across 144,058 ha of land, and create community structures (e.g. farmer cooperatives) which facilitate knowledge and information sharing among community members.	National level (one country)

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
Outcome 1: Landscape planning, policies & management effective & coordinated across sectors and scales to address climate risks & adaptation benefits						
Output 1.1. Landscape-wide land-use plan developed for climate-resilient livelihoods and forest ecosystems, integrating district strategies.	Operationalization of an Integrated Land-use Plan for Resilient Livelihoods and Ecosystems in the CND Climate change and biodiversity reflected in District Development Strategies (DDS)	Interim evaluation and final evaluation report Performance evaluations of the districts	0 integrated plans for the CND Climate change and biodiversity Indicators and targets not included in evaluations	1 draft integrated land use plan developed Climate change and biodiversity Indicators and targets fully integrated in evaluations	1 final integrated land use plan developed, approved and used Climate change and biodiversity Indicators and targets fully integrated in evaluations.	District land-use plans are updated within project timeframe Key stakeholders are supportive of cross sector collaboration. Sectoral ministries incorporate biodiversity and climate change into sectoral plans and programmes.
Output 1.2. Local and national institutional capacities strengthened to integrate biodiversity and climate risks into land use planning and management	District planners, staff within REMA, RDB, NLA, RDB with the skills and capacities to use spatial planning tools, generate data necessary for mainstreaming climate change, understand gender barriers and how to mainstream gender equality principles into planning, including supporting women, youth	Interim evaluation and final evaluation report Pre/post training assessments of unit members	0 units with capacity 0 staff reporting improved awareness and capacity.	Draft structure & function of spatial planning unit developed. Training materials in development	Spatial planning unit formally established. 36 Staff reporting improved awareness and capacity (18 Female, 18 Male)	Lack of leadership of the hosting institution/ government agency could delay the establishment of the unit. RFA is committed to lead and invest in the capacity of its staff to implement the monitoring system.

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	and marginalized groups participation in meetings					Capacity building programs can overcome the effects of high staff turn-over and frequent re-arrangement of the institutions of natural resources management (transfer of departments, merging and creation of new Ministries)
	UR GIS center with the capacity and skills to train students and staff from government agencies on spatial planning and climate modeling	Pre/post capacity assessment of the UR GIS Center	Staff with knowledge in spatial analysis and climate modeling but without quantitative skills to use new technologies/software to generate data for decision making	Training modules developed and staff to be trained identified	10 lectures and assistant lectures reporting improved skills, 20 students trained each year from year 3.	
	A system for monitoring forest trends is established and in use by the GOR	Interim evaluation and final evaluation report	0 systems in place	Operational structure & function of forest monitoring system developed	Forest monitoring system in operation	

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	Rural people, specifically women and youth, are trained and participate in land use planning processes at district level	Interim evaluation and final evaluation report	0	3 women per district 3 youth per district	30 youth 30 women	Rural women and youth groups in targeted districts are motivated to invest time and efforts in the activities.
Outcome 2: Natural forests protected, connected, more resilient to climate impacts & risks						
Output 2.1. Protected Area management effectiveness improved re climate risks and adaptation	Climate adaptation reflected in the new general park management plans	Progress report, mid-term evaluation and final evaluation	0 plans currently contain climate adaptation plans	3 General management plans updated and approved by key stakeholders	Updated general management plans guiding RDB management decisions	General Park management plans are in the process of revision during the project intervention

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	RDB has adopted a landscape approach to conservation. New iterations of park management plans reference integrated CND land use plan A framework for conservation planning at landscape level is operational, and RDB planning and monitoring dept at each park is actively engaging stakeholders	Progress report, mid-term and final evaluations	0 park management plans reference CND land use plan	1 new park management plan referencing CND land use plan RDB proactively engaging stakeholders in the land use planning process of the CND	3 new park management plans referencing CND land use plan	Limited engagement of RDB beyond parks' boundaries could delay the operationalization of the planning framework

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	Number of RDB, RFA, districts staff and local communities trained in fire forecasting, detection and management	Post-training assessments of change in capacity of trained park staff in designated positions on 1) fire detection, early warning methods and fire danger rating system and 2) management of climate information and its relevance for park management Post-training assessments of change in capacity of trained individuals in designated positions	0 staff reporting improved awareness and capacity 0 staff reporting improved capacity for fire management	15 Staff reporting improved awareness and capacity (8 Female, 7 Male) 15 staff reporting improved capacity for fire management	15 Staff reporting improved awareness and capacity (8 Female, 7 Male) 30 staff reporting improved capacity for fire management	Capacity building programs can overcome the effects of high staff turn-over and frequent re-arrangement of the institutions of natural resources management (transfer of departments, merging and creation of new Ministries) All stakeholders embrace the concept of information sharing and learning willingly and enthusiastically.
	Financial instruments to generate revenues post GCF identified and piloted	Interim and final evaluation reports Technical reports	0 financial instruments	1 financial instrument identified	3 financial instruments identified and 1 instrument piloted	GoR commitment to enactment of policies conducive to attracting investment in emerging financing solutions

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
Output 2.2. Natural forest cover restored, biodiversity connections established	Area (# ha) of degraded natural forest restored in national parks	GIS mapping of cleared areas using field GPS data	0 ha restored	4,500 ha initially cleared	4,500 ha cleared at least four times, ensuring natural regeneration can take place in Nyungwe NP	Major fire outbreaks during project implementation may prevent reaching the targets
			0 ha restored	500 ha under restoration in GMNP	500 ha restored in GMNP	The park is well managed and there are no major illegal activities
	Area (#ha) of riparian lands restored with indigenous species in the CND	GIS mapping of restored areas using field GPS data	0 ha restored	500 ha	1500 ha restored	District officials are committed to protect and create 10 m buffer around streams/rivers as per land use policy
	Area of remnant natural forest loss avoided	Interim and final evaluation	TBA	Draft strategy and action for the protection and conservation of remnant forests	Strategy and action plan developed and implemented for the conservation of remnant natural forests	RDB, REMA and District officials are committed to protect remnant natural forests

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	Area (ha) of pastoral lands brought under climate resilient silvopastoral packages in GMNP Average tree density/ha in restored silvopastoral lands	GIS mapping Bi-annual technical report Interim Evaluation and Final Evaluation Report Annual forest inventory	TBA TBA TBA	500 ha Density: 50 tree/ha	1000 ha Density: 50 tree/ha	Farmers are willing to integrate trees on their pasture lands
Outcome 3: Vulnerable rural livelihoods more climate-resilient, diverse, economically sustainable & nature-positive						
Output 3.1 Farming methods enhance productivity, reduce erosion and flooding risks, contribute to ecosystem services, and support connectivity.	Area (# ha) of forest restored on slopes >55%	Interim Evaluation and Final Evaluation Report Annual forest cover report[144] Catalogue of geo-referenced area under restoration	0 hectares	2,500 ha under restoration on slopes >55% planted with seedlings.	2,500 public and private hectares restored and maintained. density: 1,200 trees/ha	Farmers, women, and youth groups in targeted districts/sectors are motivated to invest time and efforts in the activities.

144 The Annual Forest Report is prepared by Rwanda Forest Authority. The Monitoring system for the preparation of these reports has been developed.

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	% of tree species diversity in restored areas on slopes >50%	Interim Evaluation and Final Evaluation Report Annual forest inventory	0	30% indigenous species and 70% exotic species on private land 70% indigenous species and 30% exotic species on public land	30% indigenous species and 70% exotic species on private land 70% indigenous species and 30% exotic species on public land	
	Number of target beneficiaries (households) in target sites who have adopted agroforestry measures (and report improvements in soil and water management	Interim Evaluation and Final Evaluation Report Household surveys	0	5,405 households (of which 50% are women headed households) adopted agroforestry measures	5,405 households beneficiaries (of which 50% are female).	
	Average tree density/ha in restored agroforestry lands	Interim Evaluation and Final Evaluation Report Household surveys Catalogue of geo-referenced area under restoration Annual forest inventory	0 TBA	100 trees/ha	3,346 ha of agroforestry established. 100 trees/ha	

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
Output 3.2. Rural livelihoods generate alternative incomes & reduce pressure on forests	Number of value chain products that are viable and marketed (Honey, Avocado, macadamia, horticulture)	Interim evaluation and final evaluation report Annual sales reports	0	3 products developed	5 products developed	Stakeholders in the value chains are collaborative
	Number of businesses/cooperatives with viable business plans established and operational for climate resilient value chains	Bi-annual technical report Interim Evaluation and Final Evaluation Report	37 beekeeping cooperatives with 1,965 members (32% women, 16% youth) 0 seed enterprise, nurseries farmer's cooperatives 0 cooperative of tourism guides	15 new cooperatives (40% women, 50% youth) 5 seed and nursery enterprises owned by youth and women. 2 cooperatives	20 new cooperatives (40% women,50% youth) 10 seed and nursery enterprises owned by youth and women. 3 cooperatives	Willingness of farmers' representatives of and Rwanda Cooperative Agency (RCA) to participate in the project
	Increase in household income within community associations/cooperatives engaged in the project (disaggregated by gender and social category)	Household surveys	TBA in year 1	20% additional income in participating households in new income generating activities. Targets for health benefits, and time and firewood savings TBD	An additional 10%	Successful rolled out of capacity building and linkage to outside (input-output) market

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	# of target beneficiary households adopting cookstoves	Interim Evaluation and Final Evaluation Report Household surveys	0 target households using Tier 2 cookstoves	4000 target households of which 50% are women-headed households	8,500 target households using Tier 2 cookstoves	
	Number of employments generated from the selected value chains	Interim and final evaluations Annual reports on employees hired per value chain	TBA in year 1	# women:600 # young:400	# women:900 # young:600	No outbreak of a new pandemic Farmers, women and youth groups in targeted districts/sectors are motivated to invest time and efforts in the activities.
Output 3.3. Financial services & private sector investment engage	Agriculture Credit assessment tool upgraded to include forestry	Loan approval reports generated by the tool Interim and final evaluation	0	3 MFIs and PFIs are using the tool to provide loans to smallholder farmers 70% of the smallholder farmers and gradually grow	5 MFIs and PFIs are using the tool to provide loans to smallholder farmers	MFIs and PFIs are willing to participate in this project
	Number of financial products refined, contextualized , and rolled out to improve access to finance for agriproducts for 1) vulnerable groups/ smallholders and 2) horticulture, bee products,	Bi-annual technical report Interim Evaluation and Final Evaluation Report	TBA	4 financial products refined and rolled out . At least 1 for each value chain (4 total)	6 financial products already deployed by PFIs are refined, contextualized and at least 5 rolled out by PFIs for financing	MFIs are willing to contribute in terms of staff and resources

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
	energy efficient cookstoves and ecotourism value chains				selected value chains. 10 approved loans' applications	
	Number of people including women and youth with organizational, technical and financial improved capacity	Interim and Final Evaluations	0	7,800 (40% youth, 50% women)	12,445 (40% youth, 50% women)	Farmers, women and youth groups in targeted districts/sectors are motivated to invest time and efforts in the activities.
	Number of men, women and youth who have access to thriving financial services	Interim and Final Evaluations	0	3,000 (40% youth, 50% women)	8,500 (40% youth, 50% women)	Men, women and youth are open to access financial services

E.6. Project/programme activities and deliverables

Activities	Description	Sub-activities	Deliverables
Activity 1.1.1 Synthesize & disseminate information on value of natural forests & ecosystem services	Ensure that the value of natural forests and ecosystem services for supporting climate change resilient livelihoods is fully appreciated by all sectors involved in land use decision making	1.1.1.1: Map the sectors involved in land-use planning in the CND and review how forests, ecosystem services and climate resilience is incorporated into each sector's planning process. 1.1.1.2: Conduct comprehensive literature review & stakeholder consultation to collect & synthesize information on climate risks for various	A map of the sectors involved in the land-use planning in the CND Information package on climate risks, value of forests for increasing resilience of local communities, adaptation options developed and disseminated to ministries, local government and local NGOs

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		sectors (e.g. agriculture, forestry), the value of forests for increasing resilience of local communities, and highlight adaptation solutions with cross-sectoral implications 1.1.1.3: Host workshops & presentations with key ministries, government organizations, NGOs and community organizations to disseminate high-level knowledge on value of forests for increasing resilience of local communities 1.1.1.4: Develop guidelines for integrating climate risk into land use planning and cross sectoral planning 1.1.1.5: Develop outreach materials on climate risk in the CND and the value of forest ecosystems for increasing resilience 1.1.1.6: Implement outreach program tailored to different stakeholders (local government, civil society, communities) to enhance capacities for land-use planning, funding mobilization, and delivery of climate adaptation actions 1.1.1.7 Conduct climate literacy courses for local government and civil society organizations, aimed at increasing women and youth participation 1.1.1.8 Provide financial and logistical support to trained organizations in grassroots mobilization to increase	Guidelines for integrating climate risk into land use planning and cross sectoral plan developed 104 episodes of radio drama to educate communities on climate change and gender issues, climate risks, value of forests and forests ecosystems, climate adaptation options developed Broadcast of 104 radio program episodes on a popular national radio station

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		women and youth participation in climate adaptation planning 1.1.1.9 Introduce social safeguards at a high level at each meeting, including the GRM, FPIC, and Access Restrictions Mitigations as safeguards to be in place for work with local communities	
Activity 1.1.2 Develop climate-resilient landscape land-use plan	Ensure that climate change adaptation requirements are fully integrated into planning processes at local, district and national scales.	1.1.2.1: Engage district officials, JADF, and community members in the CND (especially women) in reviewing and interpreting the NLUDMP, to ensure the plan accounts for current and future climate risks, while building local support for climate sensitive planning. 1.1.2.2: Conduct participatory land-use planning process in communities from village to district level to support integrated climate resilient land use planning 1.1.2.3: Develop Integrated Land-use Plan that supports Resilient Livelihoods and Ecosystems in the CND, ensuring alignment with National Land Use and Development Master Plan and ensuring the CND plan guides the district plan 1.1.2.4: Develop and rollout a series of trainings (virtual sessions and online modules) on gender sensitivity and mainstreaming women and youth into planning	A summary of the current NLUDMP and its recommendations relating to forestry, agriculture and climate adaptation. Reviewed/updated district level planning schemes to ensure they account for current and future climate risks (e.g. DFMPs, District Development Strategies) A community natural resources mapping manual to outline main steps in community land-use planning process A comprehensive review of national and district development plans/strategies, guidelines and projects to understand planned future land-use & climate adaptation projects in the CND and identify synergies and conflicts between land-use & climate adaptation plans from different sectors Integrated Land Use Plan developed

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		1.1.2.5: Assess specific climate impacts on historically marginalized and Category c,d,e populations through a participatory NR process to ensure the component projects address their needs for adaptation	
Activity 1.2.1: Create interagency taskforce institutionalizing integrated landscape planning & policy	Collaborative integrated landscape planning supported, which secures climate resilience undertaken with appropriate social safeguards. This activity aims to strengthen collaborative efforts, in particular between institutions (from local to national level) in charge of natural resources management to encourage synergies and avoid overlapping mandates and redundancy in different climate resilience interventions.	1.2.1.1: Review & strengthen operationalization of the current cross-sectoral task force 1.2.1.2: Hold quarterly sectoral planning meetings with both national and district administrations in CND 1.2.1.3: Facilitate discussions and provide technical support (e.g., policy briefs) in decision-making for cross-sectoral actions around climate adaptation and forest resilience in the CND 1.2.1.4: Continue to introduce social safeguards at each meeting including the GRM, FPIC, and Access Restriction Mitigations as safeguards to be in place for work with local communities. For those at the district or community level, provide options for feedback on the process and best ways of communication with local partners	A cross-sectoral planning task force operational as recognized by a ministerial order
Activity 1.2.2: Build capacity for spatial planning in national agencies re climate change	Capacity for integrated land use planning which supports climate change resilience and delivery of ecosystem services is improved. This activity aims to build the technical capacity of staff in the Ministry	1.2.2.1: Recruit spatial planning expert to support spatial planning unit	Spatial Planning Unit Operational Capacity needs assessment completed

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
	of Environment and University of Rwanda to generate and use the data on forest cover and ecosystem service values necessary for mainstreaming climate adaptation and forest resilience into land-use planning..	1.2.2.2: Assess and identify the institutional home and operationalize the spatial planning unit 1.2.2.3: Conduct a capacity needs assessment and identify the appropriate tools for spatial planning to fit the Rwandan context and conduct familiarization 1.2.2.4: Led by the spatial planning unit, develop capacity within the University of Rwanda and the MoE to use remote sensing, climate change modeling and spatial planning tools (e.g., Marxan, InVEST, RIOS, SWAT) to incorporate climate risks into land use planning processes 1.2.2.5: Deliver training workshops on utilization of earth system models for land use planning purposes, utilization of remote sensing resources (lightning, satellite radiances) for hazards detection and climate monitoring and on regional climate monitoring and applications	Capacity for forest mapping, climate change modeling and spatial analysis built within UoR and MoE
Activity 1.2.3: Develop an effective forest monitoring system to underpin forest management decisions	An effective forest, climate change and land use monitoring system is established to support climate resilient forest management decisions.	1.2.3.1: Recruit Forest ecologist or remote sensing expert to support the design and implementation of indigenous forest monitoring system 1.2.3.2: Review existing forest mapping data and monitoring software, and assess utility for generating quantitative	A report on the status of existing forest mapping data and monitoring software A design of the structure and operation of forest monitoring Two weather stations installed and operational Forest monitoring system operationalized

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		assessments of indigenous forest cover from local to national scales 1.2.3.3: In collaboration with REMA, MINAGRI, RAB, RDB, RISA, MoE and affiliated agencies and University of Rwanda, design structure and operation of forest monitoring system, including required inputs (data, computing, personnel), desired outputs, and operational structure (e.g. location, reporting structure, funding) 1.2.3.4: Purchase and install 2 new weather automatic stations in the CND 1.2.3.5: Establish & operationalize forest monitoring system 1.2.3.6: Generate updated maps & statistics for indigenous forest cover, forest type etc. using forest monitoring system 1.2.3.7: Develop capacity within hosting institution for continued operation of forest monitoring system	Updated maps and statistics for indigenous/natural forest cover and type generated Trainings delivered to develop the capacity of staff within hosting institution in forest monitoring
Activity 2.1.1: Facilitate revision of PA management plans to address climate risks	Park planning process expanded to ensure full incorporation of buffer zone and landscape linkage requirements, and ability to engage with the larger CND and district landscape management planning processes.	2.1.1.1 Review and update existing national park management plans to ensure climate and related landscape changes risks, impacts and required management responses are integrated 2.1.1.2 Provide technical and financial support to planning, research and monitoring as well as community based conservation units within RDB in	General management plans for NNP, GMNP and VNP updated

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		managing the parks as part of larger CND landscapes 2.1.1.3 Train PA staff to integrate gender and social inclusion into programming 2.1.1.4 Train PA staff on integrating needs of women, youth, historically marginalized and Ubudehe Categories c,d,e populations into climate adaptation risks and responses 2.1.1.5 Train PA staff on SEAH, GRM, FPIC, and Access Restriction Mitigation Processes to ensure NP climate change responses are undertaken in a way which supports social inclusion and equity	
Activity 2.1.2 Establish long-term plans for CND financial sustainability post-GCF	Identify financial instruments that could be employed for revenue generation post GCF as part of a broad and comprehensive RDB business planning effort for the sustainable management of the CND landscape	2.1.2.1 RFA to Recruit a Technical Advisor to guide RDB, MoE, REMA, FONERWA and MINECOFIN on sustainable conservation finance.	Technical Advisor recruited CND long term financial sustainability developed
Activity 2.1.3 New fire management curriculum developed and operationalized in PAs	Capacity increased for improved fire management in core PAs and adjacent landscapes. A collaborative effort in fire management planning and implementation in CND districts will be carried out and facilitated.	2.1.3.1 Develop a curriculum tailored to needs and capacities of different stakeholders 2.1.3.2 Build the capacity of RDB to manage fire in National Parks 2.1.3.3 Build the capacity of RFA, local authorities and communities to collaboratively manage fire in forests outside PAs	A fire training program that addresses local needs and skills gaps developed Train the trainer process completed for 25 RDB staff allowing them to instruct future classes without assistance Fire detection, early warning, and fire danger ranger system is established and operationalized

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		2.1.3.4 Implement a “fire wise” outreach and awareness program for communities and local government (district, sector, cell), as well as Rwanda Forest Authority, surrounding natural forests to reduce the incidence of human-caused fires	200 community facilitators (youth) trained to raise awareness on fires in communities surrounding natural forests and forests plantations 10,000 community members reached through social marketing events
Activity 2.2.1 Secure key remaining natural areas outside PAs	Remaining priority natural forests and other ecosystems required for climate change resilience secured through appropriate land use planning processes	2.2.1.1 Raise awareness on remaining protected natural forests in CNDL to secure their protection 2.2.1.2 In collaboration with RFA, REMA, districts identify and implement actions that support conservation and management of remnant protected natural forests in CNDL	Action plan for the conservation of remnant natural forests developed and implemented
Activity 2.2.2 Restore natural forest cover in & outside PAs including riparian linkages	Support natural forest restoration processes in PAs through improved management of alien and invasive species; and actively restore nature forest in priority areas next to core PAs and protected forests to expand the natural forest estate	2.2.2.1 Review mapping of degraded natural forest areas in core NPs, stepping stones and unprotected riparian lands using updated imagery and ground truthing 2.2.2.2 Identify parcels for restoration in core PAs, stepping stones and riparian lands using desktop and field-based assessment 2.2.2.3 Establish indigenous tree seed nurseries in the CND to serve core PAs, stepping stones, riparian land restoration and promotion of indigenous trees on farms and in protective forests 2.2.2.4 Recruit, train in forest restoration methods and equip community workers to	Indigenous tree seed nurseries established and operational 4,500 ha of indigenous forest in NNP restored 500 ha restored in Gishwati Mukura NP 1,500 ha of riparian lands restored

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		be involved in core PAs restoration and riparian linkages 2.2.2.5 Restore 4500 ha of indigenous forest in NNP 2.2.2.6 Restore 500 ha Gishwati Mukura National Park 2.2.2.7 Restore 1,500 ha of riparian lands 2.2.2.8 Using permanent plots sampling, collect field monitoring data on tree species recruitment and growth for estimation of biomass, species richness etc. in restored parcels in Nyungwe and Gishwati-Mukura National Parks in restored parcels in Nyungwe and Gishwati-Mukura National Parks as well as on riparian lands to assess success of initiatives, then replicate or adapt as needed 2.2.2.9 Perform Environmental and Social Screening on all positions being created by the project 2.2.2.10 Establish a grievance process for laborers 2.2.2.11 Update emergency and preparedness plan including risk mitigation guidance to local conditions at restoration sites	
		2.2.2.12 Train all workers on their rights and how to access the GRM	

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		2.2.2.13 Provide code of conduct and emergency preparedness and safety training for all laborers 2.2.2.14 Hire and train labor and safety leads at each site to provide guidance to staff, be available for grievance issues, and monitor health and safety conditions for workers 2.2.2.15 Develop and implement strategy (including social marketing) to ensure that women and youth participate and benefit from forest restoration projects	
Activity 2.2.3 Promote silvopastoralism with indigenous trees in Gishwati Pasture areas	Existing pasture lands will be characterized and livestock farmers clustered according to the size of their grazing lands. Tree species that exist on their grazing land will be identified and grouped according to the level of their resilience to climate change. A participatory approach will be used to assess livestock owners' preferences for indigenous species on their farms. Sites will be identified for indigenous tree nursery establishment and nurseries will be established in project sites and managed by the livestock communities.	2.2.3.1 Assess the status of pasture lands in Gishwati area and identify key areas for restoration and the potential to introduce indigenous species 2.2.3.2 In collaboration with landowners, identify suitable indigenous species for fodder trees, shrubs, grasses, and herbaceous legumes that have potential to improve pasturelands and increase their climate adaptive capacity 2.2.3.3 Produce and disseminate fodder trees, shrubs, grasses, and herbaceous legumes to project beneficiaries 2.2.3.4 Train beneficiaries on improved livestock and pasture management	1,000 ha of pasture land in Gishwati grazing area restored with indigenous tree species

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
Activity 3.1.1 Restore high slope areas (>55%) as protective forests	Promotion of protective forest and agroforestry practices to improve landscape connectivity and ability to deliver ecosystem services	3.1.1.1 Introduce and raise awareness of indigenous species to target stakeholders in CND 3.1.1.2 In consultation with RFA, National Land Authority, districts and communities, determine fragile areas (steep slopes > 55%) to be allocated for protective forests and their ownership 3.1.1.3 Assess the current status of the indigenous tree species in selected areas for protective forests and select indigenous tree species appropriate to CNDL 3.1.1.4 Develop restoration plan for protective forests 3.1.1.5 Build capacity of local stakeholders (men and women) on PFMU approach and methods 3.1.1.6 Design and approve SFMPs of private FMUs 3.1.1.7 Ensure consent of smallholders prior to planting trees (SS) 3.1.1.8 In collaboration with smallholders reforest/restore 2,500 ha of public or private land with slopes >55% and ensure sustainable management under private FMUs according to approved SFMPs 3.1.1.9 Support monitoring and evaluation of restored private FMUs	2,500 ha of protective forests on high slope areas restored

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
		3.1.1.10 Assess impacts of exotics on neighboring lands and mitigate their negative impacts (SS) 3.1.1.11 Develop and implement strategy (including social marketing) to ensure that women and youth participate and benefit from forest restoration projects (G) 3.1.1.12 Assess the benefits and costs of each proposed tree and plant species and how those benefits affect different population segments (SS)	

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
Activity 3.1.2 Develop on-farm agroforestry for high caloric and indigenous tree species	Implement agroforestry/sustainable land management (SLM) over 3,346 ha of smallholder farmland	3.1.2.1 Identify sub-areas of intervention for agroforestry dissemination in the CND 3.1.2.2 Introduce and raise awareness of agroforestry in target communities 3.1.2.3 Develop the capacity of extension agents at district/sector level and NGOs to support adoption of agroforestry technologies 3.1.2.4 Establish agroforestry/fruit tree nurseries to facilitate access to quality planting material 3.1.2.5 Promote sustainable land management practices by stabilizing existing terraces, and plant high calorific agroforestry species to provide a sustainable source of fuelwood for energy efficient cookstoves to protect sloping land against severe soil erosion 3.1.2.6 Train RFA, extension agents, Project participants and community members on specific techniques for identification of and management of invasive pests and pathogens (SS)	SLM/agroforestry established on 3,346 ha of smallholder land

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
• Activity 3.2.1 Develop forestry and agroforestry-related value chains for market access	Vulnerable groups of youth and women identified and their capacity for production (quality and quantity) enhanced in sync with particular niche markets demands	3.2.1.1 Identification and mapping of vulnerable groups of youth and women within the CND 3.2.1.2 Capacity building for farmers' cooperatives/unions on good agricultural practices (GAP) for market standards in the selected agroforestry-related tree fruits and horticulture 3.2.1.3 Development of Global GAP standards modules and market access linkage for the selected value chains 3.2.1.4 CND Honey value chain capacity production, market, and financial development 3.2.1.5. Tourism value chain development	Vulnerable groups of youth and women within the CND identified and grouped into cooperatives 5 Value chains identified and beneficiaries selected GAP training for 900 people from targeted cooperatives and unions completed Train of trainers completed for 30 cooperative members New tourism trails and base camps outside of Gishwati-Mukura NP developed and operational Community freelance tour guides trained and operational
• Activity 3.2.2 Facilitate and scale up climate-resilient value chain products	This activity aims to build the capacity of smallholder farmers in producing, processing and marketing quality products that meet national and international standards to be competitive on the market	3.2.2.1 Value chain contextualization in focus areas in the CND 3.2.2.2 Facilitating market accessibility	25 youth and women cooperatives/enterprises with the capacity to deliver quality products and services
• Activity 3.2.3 Facilitate access to markets for vulnerable farmers	This activity will focus on enhancing productivity (quantity, quality, and sustainability at the farm level) and exploring the market linkages model between farmers, suppliers, and buyers.	3.2.3.1 Development of farmer-inclusive business models	900 cooperative members are linked to the market from farming inputs suppliers and production aggregators through inclusive farming-as-a-business.

E.6. Project/programme activities and deliverables			
Activities	**Description**	**Sub-activities**	**Deliverables**
• Activity 3.2.4 Scale up production, use and sales of fuel-efficient cook-stoves	Evaluate and promote financing models that sustainably foster energy efficient cook-stove access to historically marginalized communities and other vulnerable groups of the CND	3.2.4.1. Identification and production of Energy Efficient Cooking-Stoves 3.2.4.2. Energy efficient cook-stoves distributed to CND community members and categorization based on UBUDEHE Categories	8500 households have access to EES
• Activity 3.3.1 Facilitate access to finance & private sector investments	Build common understanding between value chain actors and private financial institutions towards selected value chains	3.3.1.1 Tailoring credit assessment tool for selected value chains, while integrating climate impact data 3.3.1.2 Facilitate access to finance for selected value chains	Agriculture Credit assessment tool upgraded and adopted by PFIs At least 15 projects of the 5 selected value chains funded by PFIs
• Activity 3.3.2 Set up & support savings & loan groups, enhance asset-building	Strengthen the capacity of local smallholders' farmers in financial literacy and access to finance	3.3.2.1 Establish/form saving groups for access to finance	Cooperative members are linked to PFIs and at least 70% have accessed to financial service and loan
• Activity 3.3.3 Build capacity of financial institutions to serve targeted value chains and communities	Undertake a climate screening of financial service providers using the green index tool and support PFIs to access and adopt a digitalized forestry and agri-loan assessment tool	3.3.3.1 Capacity-building of PFIs	PFIs have developed an environmental policy and strategy for their organization including staff awareness training and integration of climate and livelihood impact measurement systems
• Activity 3.3.4 Facilitate learning & knowledge sharing	Produce and share lessons learned during the implementation of this project	3.3.4.1 Programme-embedded learning and reflection	ESMP

E.7. Monitoring, reporting and evaluation arrangements

The Project's logical framework outlines the expected results, indicators, means of verification, baseline values and target values at mid-term and end-term. The Project Coordinator will be responsible for the overall monitoring of Project progress and reporting to the PSC. A national M&E Specialist hosted under the PMU, supported by EE-based Specialists, will be employed to develop practical guidelines for — and operationalize — a performance monitoring framework to track the Project's progress towards achieving its targets. The national M&E Specialist will be responsible for: i) establishing a performance monitoring framework to define biannual targets; ii) measuring the indicators at least 1–2 times per year to evaluate the progress of the Project; iii) reporting to the Project Coordinator and PSC; and iv) participating in the production of reports. RFA M&E Specialist will support the National M&E Specialist by: i) following guidelines developed by the national M&E specialist to conduct performance monitoring; ii) measuring the program indicators at least 1–2 times per year; iii) ensuring all activities comply with the Project's ESMF process and procedures; iv) supporting environmental screening and helping to follow the Environmental Management Plans; and v) participating in production of reports. The M&E Specialists will be supported by a Gender Specialist to oversee and monitor the application of gender disaggregated indicators. The M&E Specialist and Gender Specialist will perform regular visits (at least once/year), randomly selecting villages to monitor implementation. They will use these visits to cross-check the information provided by EE and beneficiaries in monitoring reports. During each visit, the team will collect qualitative data on implementation outcomes and difficulties through focus group discussions with beneficiaries and interviews with key stakeholders. The national M&E Specialist, supported by the EE M&E Specialist will then compile quarterly Project reports outlining progress in each site, allowing for feedback and support from the PMU and PSC in case of delays or challenges. MoE, as the AE, will perform supervision missions from year two onwards, selecting sites to visit each year and assessing the status of implementation. In addition, the MoE procurement office — which oversees the destination and use of funds disbursed to the EE — will monitor the Project's compliance with policies and procedures, as well as alignment between implementation and objectives. The annual performance reports will include a narrative report (with supporting data) on implementation progress based on the logical framework in the Project, including a report on ESMS as well as gender. The report will be aligned with the modalities set out in the GCF results management framework and its performance measurement frameworks.

As per the AMA, an independent consultant will be contracted to conduct an Interim Evaluation and Final Evaluation. Both will comply with GCF evaluation policy and international standards and make use of qualitative and quantitative data analyses, including interviews with relevant stakeholders, data provided by the Project, EE M&E Specialists and Gender Specialist, and participative workshops and focus groups with beneficiaries. The MTE will analyze whether the Project is on track, any problems, and challenges, and required corrective actions. The PSC and PMU will develop a management response to the recommendations along with an implementation plan, and the PMU will monitor implementation of the recommendations. The Final Evaluation will be an independent assessment of Project performance against its contributions to a paradigm shift and enabling environment.

● (f) RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures

Selected Risk Factor 1 - *Lack of coordination, institutional resistance, and regulatory barriers to mainstreaming climate change into land use planning*

Category	Probability	Impact
Macroeconomic/Political	Low	High

Description

Despite its progressive policies, Rwanda has historically had limited capacity for mainstreaming climate change into government/institutional practices and given the pervasive ways in which the impacts of climate change impact across numerous sectors, ministries and government agencies will need to work across any perceived or real institutional barriers to align and mainstream climate change in land use planning. For example, the Rwanda Development Board has historically not worked beyond Park boundaries, and this will be integral for institutionalizing the climate change adaptation processes across the Congo Nile Divide as a large interconnected landscape. Additionally, insufficient coordination, collaboration and information-sharing between relevant government departments, and research institutions may hinder or limit participation of relevant institutions and agencies, reducing the timely delivery and effectiveness of the Project, especially the aspects related to mainstreaming climate change in land use planning and other components of the Project as well. Furthermore, the perception of an uneven playing field, with larger or more well-connected institutions and companies able to evade the payment of environmental fees and fines under existing legislation, may undermine the uptake of the other options for financial sustainability of improved PA and forest ecosystem management.

Mitigation Measure(s)

The Project is part of a larger suite of efforts supported by the multi-agency Project Steering Committee (PSC) to create a spirit of cooperation among the various agencies and institutions charged with addressing climate-related issues. The PSC demonstrates Rwanda's commitment to fulfilling mainstreaming of climate adaptation into regular government processes and procedures. As such numerous government agencies have already had the opportunity to work together on a variety of climate-related issues, align institutional policies and reduce any potential regulatory barriers to ensure successful implementation of projects related to climate change. The PSC will directly oversee the Project Management Unit, and with this larger guidance structure, the EE will communicate to the PMU and the PSC on a regular basis to prompt collaboration and address any unforeseen institutional or regulatory barriers encountered during the life of the Project for immediate attention and remediation. PSC will address the risk of evading the payment of environmental fees by facilitating buy-in from stakeholders such as RDB and MINECOFIN into compliance with environmental laws through greater emphasis on the links to climate resilience and NDC objectives. These measures will reduce the impact to LOW.

Selected Risk Factor 2 - *Extreme weather/climatic events hinder the ability to deliver Project objectives*

Category	Probability	Impact
Other	Low	Medium

Description

The activities that will deliver overall Project success involve dependencies on weather conditions for successful implementation of the projects that rely on accessing steep slopes, planting trees, and establishing beekeeping operations. Extreme events such as heavy rainfall or prolonged drought could severely limit the success of these endeavors making sites inaccessible, creating unfavorable conditions for seedling survival, and decreasing the potential success of new beekeeping operations. This region, given its topography and the expected climatic variability, is likely to experience these types of disruptions. Severe disruptions may impede implementation, including potential implementation delays and fall under GCF's policy on restructuring and cancellation. That said, it is unlikely these extreme conditions will present themselves in the next 5 years for the duration of the project.

Mitigation Measure(s)

As weather is unpredictable, any mitigation measures will not change the probability nor address the impact in the short term. As the entire project is envisioned to improve the resiliency of this landscape to climate variability and promote adaptation, the specific activities will be able to mitigate, and in some cases prevent, longer-term impacts. As our implementation arrangements involve bolstering the climate adaptation capacity of the government and the communities in the CND, the entire project itself will serve as mitigation to this unlikely outcome.

Selected Risk Factor 3 - *Project staffing and capacity*

Category	Probability	Impact
Operational	Low	Medium

Description

Implementation of the Project hinges on staffing of the Project Management Unit, hiring additional staff within the EE and recruiting thousands of additional laborers in the form of community engagement specialists, contractors for building terraces, individuals to remove ferns, contracts to construct and deliver stoves, consultants to contribute expertise on behavior change, invasive species/pest management, and gender sensitization. Many factors could intervene to slow or thwart hiring progress including the high turnover of staff in the implementing institutions as frequent changes in government bodies could result in a disruption and/or delays in implementation.

Mitigation Measure(s)

Rwanda has a successful track record of implementing large scale projects through government ministries. Competent staff will be available for project implementation, and their abilities will be enhanced through the commitment to training individuals involved in the program. This risk, if realized, may impede implementation including potential implementation delays and fall under GCF's policy on restructuring and cancellation. Therefore, the Project will invest heavily in strengthening institutional capacity to promote climate resilience and apply actions that directly increase the resilience of ecosystems and community livelihoods. The Project will also document decisions, best practices and lessons learned to support the institutional memory to sustain Project activities in case of high staff turnover. Labor and safety as well as community security plans to be established as part of the ESAP (Annex 6) will make the Project a desirable place to work. Mitigation measures reduce impact to LOW.

Selected Risk Factor 4 - *Inadequate incorporation of gender, and environmental and social safeguard (ESS) considerations into the implementation of the proposed Project activities as well as its management structures and systems*

Category	Probability	Impact
Technical and Operational	Low	Medium

Description

Should ESS be inadequately considered in the Project or in the management and governance structures, there could be social and environmental implications. To start there may be a disproportionate distribution of benefits to certain segments of society. Although the Project's primary beneficiaries include women and other most vulnerable people, there is a risk that the Project implementation will experience preferential treatment at sites that favor certain groups over others. For example, despite tremendous policy and legal efforts, a patriarchal culture and persistent disparities in education, employment, land ownership and other factors characterize gender relations in Rwanda and could cloud implementation efforts. Likewise, some vulnerable groups may be unable to benefit from the efforts, such as landless people unable to benefit from trees or having a safe place for a new cookstove. One serious risk afflicting major projects such as that proposed, if not properly addressed, includes sexual exploitation, sexual abuse, and sexual harassment (SEAH) which may be prevalent if preferential treatment occurs (e.g., interfamily SEAH in retaliation for benefits received by women rather than men) or there may be power dynamics with hired staff who work with communities and withhold Project benefits within a SEAH conflicts (e.g. requesting sex for an opportunity to participate in the project, harassment if potential beneficiary refuses). On the environmental side, several environmental risks detailed in Section F and Annex 6 could undermine the success of the Project including topsoil loss and possible collapse of the terraces, unsustainable practices for sourcing clay for the cookstoves, and inadvertent introduction of invasive species, pests or pathogens from the nurseries to the field sites.

Mitigation Measure(s)

The Project anticipates these challenges and has envisioned multiple participatory aspects to the Project that are guided by the gender action plan and the ESAP. To mitigate social risks, local community engagement will be facilitated by the EE in cooperation with local community organizations through the integrated landscape delivery teams (ILDT) and the Joint Action Development Forums (DJAF). Safeguards in place to support Labor and Community Health & Safety will require training/sensitization to SEAH and the repercussions for those who engage in such activities (i.e., termination of employment). In the hiring process, staff will be screened for prior infractions. Hired staff will be trained in survivor-centered and gender-responsive approaches to support any victims of SEAH in association with the Project activities. To minimize environmental risk, the PMU and the EE will adhere to the environmental action plan and oversee the hiring of contractors to perform the activities. Multiple consultants or specialists, if not part of subcontracts, will be recruited to train project participants on mitigating measures to reduce these risks. If the proposed ESAP is followed properly the impacts will be LOW.

Selected Risk Factor 5 - *Lack of adoption among target populations for livelihoods activities*

Category	Probability	Impact
Technical and Operational	Medium	High

Description
The success of the Project depends upon the integration of activities such as beekeeping, improved cookstoves, planting of fruit trees and terrace construction on private lands by the project beneficiaries. If planned and executed incorrectly a myriad of issues could prevent beneficiaries from adopting the activities beyond the life of the Project. This includes but is not limited to overlapping or misalignment between the proposed Project activities and those being implemented by other government departments or non-government organizations in the Project area.
Mitigation Measure(s)
Numerous international development projects have experienced mixed results upon completion regarding the uptake of promoted activities into daily lives. This Project has a strong behavior change component based on current best practices in identifying the barriers to behavior change, removing those barriers, and changing norms thus ensuring, through adequate participation and training, that the activities will be adopted and maintained over time. The work plan involves ample collaboration with women and youth groups through the ILDTs to build long-term community ownership for the Project. Further, if there are activities being promoted by the government or other NGOs that either overlap with the proposed activities or contravene with the Project activities, adoption by intended beneficiaries may be disrupted. As such the NSC will serve as the overarching body to ensure such projects within similar geographic regions remain aligned. These mitigation measures reduce the impact to MEDIUM.

Selected Risk Factor 6 - *Unforeseen disruptions due to another COVID variant*

Category	**Probability**	**Impact**
Other	Low	Medium

Description
As demonstrated during the recent years of the COVID pandemic, variants may cause unforeseen disruptions to travel and Project implementation.
Mitigation Measure(s)
The Project will likely start well after COVID has run its course; however, in the event of new variants the PMU and EE will be ready to implement necessary COVID-safety practices such as masking, social distancing and reducing travel to areas with low health care options. Mitigation will reduce impact to LOW.

Selected Risk Factor 7 - *Prohibited practices including money laundering and terrorist financing*

Category	**Probability**	**Impact**
Prohibited Activities	Low	Medium

Description
The Project involves a large number of actors for successful implementation including ministries, government agencies, NGOs, sub-grantees, vendors, service providers, community members and beneficiaries. Specifically, there is an intention to distribute or disperse to beneficiaries both directly and indirectly commodities and other items of value such as the distribution of seedlings for trees that will produce fruits or contribute to enhancing biodiversity of farming systems, access to improved cook stoves as well as the

possibility for distribution of bees to start honey operations. As with any project infusing large sums of money directly or indirectly with multiple actors, corruption could occur.

Mitigation Measure(s)

Since the 1990s Rwanda has set a social foundation for anti-corruption efforts by establishing policies and procedures to prevent corruption/reduce vulnerability to corruption and sanctioning misbehavior through prosecutions. Specifically, a reduction in administrative corruption is of note for a large project such as the one proposed. The systems in place will reduce the potential for prohibited activities. Additionally, commitment to campaigns for individuals to report corruption has created a societal norm for intolerance. As a result, Rwanda moved from a state of high corruption 20 years ago to a level on par with middle income countries. The International Monetary Fund published an assessment of Anti Money Laundering and Combating Financing of Terrorism in 2015 indicating that while the risk of AML/CFT is low, at that time more could be done to bolster the systems in place to address the issue. At present, the GoR has robust measures to fight money laundering and terrorist financing. This was done first by enacting the law N° 001/FIC/2022 of 16/02/2022 on Regulations relating to anti-money laundering, combating the financing of terrorism. The Rwanda government has also put in place a special agency for this purpose named Financial Intelligence Center (FIC) with a clear mission to promote financial system integrity by conducting effective financial intelligence to counter money laundering, the financing of terrorism and related financial crimes in governmental institutions, projects, and parastatal agencies under the supervision of the Ministry of Finance and economic planning. MoE and the GCF Project under its supervision will also comply with FIC regulations. The MoE also has an Internal Audit function as well as regular audit conducted by the Office of the Auditor General to carry out the efficiency and effectiveness of internal controls.

Regarding higher level security threats, at present, there are no UN Security Council Sanctions against Rwanda, though it is noted that there are sanctions in Democratic Republic of Congo, close to the Congo Nile Divide. The UN Security Council Consolidated Sanctions list indicates approximately 20 individuals with ties to Rwanda, a small percentage of whom may live in the country. This list has been circulated to the AEs and will be cross checked when hiring for the project and once project sites are selected to ensure these individuals will not be involved in any manner with the Project or its activities, either as a counterparty, implementer, or beneficiary.

To report and remedy any risks that may occur, the MoE will maintain a Project level grievance redress mechanism to which anyone can report on the occurrence of prohibited activities. All complaints will be investigated following the process identified in Annex 6. Any complaints believed to contribute to prohibited activities will be referred to the appropriate authorities in Rwanda.

Assuming all staff will be made aware of the prohibited activities, all subcontractors/counterparties will be screened for engagement of activities and made aware of their obligations to alert the PMU and/or submit grievances related to such activities occurring as part of the Project, the overall impact of the money laundering and financing of terrorism risk on the Project will be LOW.

Selected Risk Factor 8 - *Political Risk*

Category	Probability	Impact
Other	Low	Low
Description		

Political risk is in part driven by long-standing frictions with neighboring countries and the potential for domestic instability in these countries to spill over into Rwanda. These geopolitical challenges constrain Rwanda's longer-term development as a services hub. Although the government of Rwanda has been effective in its pursuit of social stability through targeted transfers and support and improving accountability at all levels from Villages and to national levels through village councils, JADF and Umushyikirano (National Dialogue Council - an annual forum that brings together leaders and citizens to reflect on the country's progress and share ideas to solve ongoing challenges, this political risk may impede implementation including potential implementation delays and fall under GCF's policy on restructuring and cancellation.

Mitigation Measure(s)

Much of the work of the project will be taking place within a Ministry and through work at the community level. Oftentimes, regardless of political instabilities, communities with devolved decision-making structures and local capacity will have a greater chance to withstand that instability and continue to operate. For this project, much of the work will be turned over to the local community leaders and the laborers hired locally who will be trained and will then own the capacity to do this work in the long-term, regardless of what national leadership is in place. The structures resulting from this workplace citizens participation in decision making which will constitute a buffer against potential domestic instability. Mitigation will reduce impact to LOW.

Selected Risk Factor 9 - Expansion of tea plantations

Category	Probability	Impact
Macroeconomic/Political	Low	High

Description

Projected climate changes predict significant elevation rises in CND agro ecological zones, including the potential for tea cultivation at much higher elevations than at present. This is unlikely to threaten Rwanda's existing montane forest protected areas, as foreign revenues from tourism in these reserves far surpass those from tea. However, tea remains a significant source of foreign revenue and a government target for expansion. Any increased tea production in the CND would therefore most likely affect lands outside of parks: smallholder, cooperative, and district holdings, many of which might also be targets for reforestation, agroforestry, and biodiversity stepping stone initiatives under this Project.

Mitigation Measure(s)

The integrated land use planning included in this Project design, will bring together tea industry, agriculture, forestry, biodiversity, and tourism interests to identify and reduce such potential conflicts over use of the CND's limited land resource base. Through this integrated land use planning we aim to establish a formal public-private sector forum at the landscape level to help improve communication across sectors, appreciation of environmental issues, and increase synergies between interventions to avoid conflicting targets and indicators between sectors and advocate for mainstreaming biodiversity and climate change in different economic sectors.

Selected Risk Factor 10 - Timely provision of Co-financing

Category	Probability	Impact
Other	Low	Low

Description
The Project co-financiers may delay providing their co-financing commitment which can jeopardize implementation and hence project intended objectives could not be met.
Mitigation Measure(s)
The Accredited Entity has already requested for commitments of co-financing from all the project co-financiers which are already Government of Rwanda institutions, and all the committed co-financing are already part of the Institutions Day to day mandates hence there is anticipated low impact on the project implementation

(e) GCF POLICIES AND STANDARDS

G.1. **Environmental and social risk assessment**

As proposed, the environmental and social risk category for the Project is **Category B or 'moderate risk" according to GCF classification. The project was** partially screened for potential social and environmental risks, following GCF requirements (Annex 6). All preliminary potential negative impacts for activities and sub-activities were determined to be minimal, reversible and readily mitigated through generally accepted mitigation measures and standard international practices, thus in the low to moderate categories. While the impacts will occur within the Congo Nile Divide Project area boundary and implementation zone, the specific locations and communities affected by Project activities will be determined in Project implementation thus an Environmental and Social Management Framework has been developed for a more thorough screening of all activities by the AE/EE.

Summary of Risks	**Mitigation Factors / Measure and Management Strategies**

Environmental and social risks: For all Project components, disproportionate benefit distribution to some groups and not others including women, youth, historically marginalized people and Rwanda's poverty categories (Ubudehe) C, D, and E is a risk. Such power differentials could exacerbate exposure to sexual abuse, exploitation and harassment, a risk that may affect all Project components if unmitigated. The Project may cause social risks including loss of access to lands due to new land classifications or stricter implementation of land use and park laws, displacement of informal land occupants due to afforestation/reforestation, and loss of access to land for food production. The potential for invasive species spread in the reforestation/afforestation components, water usage during increased seedling production at nurseries, terrace stabilization for planting, loss of topsoil to erosion during planting, disturbance to wildlife during afforestation or reforestation, modification of water flow and topsoil that could increase exposure to disease, increased human-wildlife interactions with increased tree cover and fruit trees, air quality impacts from cookstove production at scale, and supply chain impacts for livelihoods interventions all have associated environmental and social risks to be thoroughly vetted as specific sites and beneficiaries are identified.	The PMU will hire an Environmental and Social Safeguards (ESS) Specialist to oversee the application of the ESMF for a more thorough assessment of impacts by specific activities during Project implementation. The ESS Specialist will also oversee stakeholder engagement, sensitize all relevant staff on social safeguards and community engagement including SEAH training, and ensure Project activities target vulnerable groups to build resilient livelihoods. Consent processes will be established with communities. The Project will have a Project-level grievance redress process available to address complaints that aligns and complements the grievance redress used by the MoE. The PMU will also hire an Environmental Management Specialist (EMS) who will work with the ESS on environmental assessment and implementing proper mitigation processes as required.
Summary of Risks	**Mitigation Factors / Measure and Management Strategies**
Labor and working conditions: The dangers involve the potential for sexual abuse, exploitation and harassment (SEAH) in the hiring process or while working, forced labor, child labor, and exposure to occupational health and safety risks. These risks include safety of laborers removing ferns and planting trees on steep slopes, exposure to potential disease vectors in standing water or soil and large scale fabrication of stoves, risks using the machinery in the production of stoves, exposure to bees in honey production as well as other similar risks.	The ESS will coordinate with AE/EE human resources staff to conduct a Labor and Working Conditions Risk Assessment that will inform the development of a Labor and Working Conditions Risk Management Plan. The ESS and HR staff will appoint field safety leads within each sector. These individuals will receive training on National Laws governing labor and working conditions, SEAH, and other risks relevant to the activities that involve the hiring of laborers during the course of the Project.

Resource efficiency and pollution prevention: The stabilization of terraces risks topsoil loss and terrace collapse due to deteriorating conditions and improper long-term maintenance and extreme weather events. Pollution/waste may be created across the supply chains for stove production and distribution. Pesticides and fertilizers may be used for seedling production. Water usage in nurseries could divert resources for others. The release of CO2 emissions in the sourcing and distribution of materials in reforestation/afforestation as well as the livelihood enhancement activities could also pose a risk.	The ESS, EMS, and a Procurement Specialist will conduct activity-specific assessment for resource efficiency and pollution control. During implementation they will oversee subcontracts for reforestation/afforestation and all livelihoods enhancement projects. For stabilization of terraces, the subcontractor will have an engineer oversee the technical components of stabilization to ensure best practices and reduction of risks. For livelihoods enhancement projects the ESS and Procurement Specialist will ensure environmentally sourced materials and establish measures to minimize production waste and maximize distribution efficiency of stoves. The EMS will work with nurseries on plans for mitigating pesticides, fertilizers and water use.
Community safety and security: Increased risk of forest fires due to increasing tree coverages, increased exposure to vector-borne diseases, human wildlife conflicts associated with reforestation/afforestation and the influx of international funding that shifts power dynamics and creates environments prone to increased incidents of SEAH. With expected changes in land classifications, interactions among law enforcement and informal land owners or communities who use the resources could become more prevalent and increase risks of harm if law enforcement lacks proper training for working with communities. Work on steep slippery slopes, working with bees, use of new cook stoves and work in remote locations (e.g., fern removal) will require safety considerations for participating community members. Extreme weather or global events (e.g. pandemic) may disrupt safety and security.	The ESS will screen each activity for community, safety and security risks. The EE will have at a minimum, an Emergency Response and Preparedness Plan to address specific local hazards and response at each site; all staff will be trained on the plan as well as on disease prevention and hygiene, SEAH prevention, and addressing human-wildlife conflicts. The PMU will need to address at a high level across the GoR the potential for escalating conflicts among landowners and law enforcement as land classifications change in the course of the Project.
Summary of Risks	**Mitigation Factors / Measure and Management Strategies**
Resource access/restrictions: Land classification processes could result in changes that affect resource access due to existing land use, occupancy, and land tenure in the CND especially among farmers, settlers, and traditional uses of the land and forest. At a smaller scale with less risk, as tree planting and transitions to native or value-added species (e.g. fruit trees) commence, access to tree resources may be diminished until trees grow larger and become usable.	The ESS will screen all Project activities for the potential to cause displacement, namely access restrictions to resources. The Project is committed to stakeholder engagement and will mitigate access restrictions risks through a process framework and mitigation hierarchy. The AE grievance redress process will manage access complaints.

Biodiversity conservation: The inadvertent introduction of non-native/invasive pest species/diseases during forestry/agroforestry related activities could negatively impact production and forest health. Wildlife may be disturbed in the course of fern removal and/or tree planting as well as other potential livelihood activities that will be implemented. Human-wildlife interactions may increase as a result of increased forest cover and fruit trees being available in the CND. This could cause landowners to retaliate against wildlife.	The ESS will screen all Project activities for biodiversity and conservation risks/impacts. Mitigation measures will be put in place to ensure tree planting, nursery management, and seedling distribution incorporate training by consultants on invasive species recognition and management and that options for managing human-wildlife conflicts are able should issues arise.
Historically marginalized peoples: Rwanda is a nation with a single/common culture, tribe, language and with a national constitution that recognizes all Rwandans are born and remain equal in rights and freedom (article 16 of Rwandan Constitution, 2015). That said, there are historically marginalized groups as well as categories c,d, e, groups in the areas of the project activities. The risks are that the impacts of project activities on these groups are not adequately considered and analyzed and further that the intended benefits for these groups do not materialize given a lack of attention to their particular needs and vulnerabilities. Should this occur, the overall intent of the project could be in jeopardy given the focus on making such communities more resilient in light of climate change uncertainties.	As the project focuses on providing benefits, in particular increased resilience to climate change for vulnerable communities, the ESS will pay particular attention to the screening for activity level impacts on historically marginalized and categories c,d,e. Thus far, 24 focus groups with 4 exclusively historically marginalized, 5 exclusively women and 3 exclusively youth participants informed the project design and provided insights on impacts and improved ways of benefiting individuals in these groups (see Annex 6, section 4). A detailed plan for engaging with women, youth, those below the poverty line and landless groups will be prepared by project staff in collaboration with district, sector, and local ngo leaders in the project implementation phase as specific projects and locations are determined. In addition, all interactions with these groups will include processes for obtaining consent as well as clarity regarding access to the grievance redress process should complaints arise during the project.

Risk details and screening assessment to be conducted in Project implementation are described in the Partial Environmental and Social Impact Assessment and Environmental and Social Management Framework (Annex 6). Positive project impacts include a focus on improving resilience of the most vulnerable communities, communities stewarding/ harnessing the carbon cycle and reducing greenhouse gasses by sequestering carbon (i.e., through conserving indigenous trees, increasing soil organic carbon, and practicing regenerative agriculture); and utilizing efficient cook stoves. The PMU/ESS will be responsible for conducting screenings, including screenings for project-level impacts on historically marginalized groups of each Project activity as specific locations and beneficiaries are determined and with implementing mitigation measures aligned with Rwanda National Laws and GCF policies and practices. These measures include a commitment to training in all relevant EE staff on stakeholder and community engagement; consent with local communities; access restrictions mitigations; SEAH and adhering to the labor and safety laws that meet international best practices. The full Stakeholder Engagement Plan can be found in Annex 7. The EE and the AE will develop a compliance monitoring, supervision and reporting schedule that meets requirements in the GCF Information Disclosure Policy and Environmental and Social Policy. The AE will establish a

Program-level grievance redress mechanism that includes a process of public notification, documentation, investigation and resolution. This GRM will complement the MoE GRM.

G.2. Gender assessment and action plan

Women, youth and marginalized groups in the CND are key stakeholders in the Project and its primary beneficiaries. The Project will be implemented across various sectors along the CND, where natural forests are particularly vulnerable due to high population, increasing dependence upon fuelwood, and illegal use of forests to improve income streams. The Gender Assessment uses a range of primary (24 focus groups and 18 key informant interviews) and secondary (published reports, policies and academic literature) sources to triangulate our understanding of gender in climate resilience and Project design. The Gender Analysis identified and analyzed gender risks and impacts of the program and climate change through four steps: scoping; legislative and policy review; stakeholder consultation and analysis; and baseline analysis. The Action Plan operationalizes the findings from the Assessment, the ESIA, and youth-based information collected during the feasibility studies and stakeholder consultation. Despite tremendous policy and legal efforts, a patriarchal culture and persistent disparities characterize gender relations in Rwanda. Disparities persist in post-primary education; in access to and control of property, including land and economic resources; in employment opportunities and entrepreneurship; in decision-making at household and community levels; in family responsibilities and unpaid care work; and in the experience of violence, harassment, conflict, and insecurity. Sexual and gender-based violence persists at high levels. While women have made impressive political progress, especially at the national level, their local political representation and engagement remains unequal. Economic opportunities remain markedly gender-differentiated. In Rwanda and the CND, structural barriers to economic and political equity and female empowerment have significantly impeded measures to adapt to climate change impacts. While these structural inequalities are lower compared to other countries because of leading gender-considerate policies across sectors, the point remains that women's ability to access, use and control natural resources, infrastructure and services is different and low compared to men. This means the degradation of natural resources and new infrastructure will affect genders differently and result in greater vulnerability for women. However, women are vital change agents and can be powerful leaders from community to global levels in mitigating and adapting to climate change. Three key themes in the Gender and Social Inclusion Action Plan include i) Change negative gender and social norms, ii) Provide access to skills building, leadership and programmatic inclusion, and iii) Facilitate women's financial autonomy. Youth account for over 50% of Rwanda's population. An analysis was done to determine how GCF funding could support activities to align with and strengthen the sustainability of the overall program by supporting youth through the following activity themes: i) Non land-based opportunities, ii) Access to skills building, and iii) Youth leadership and Programmatic Inclusion. Social norms are difficult to change, and deeply entrenched biases will require active engagement by men, women, and youth, in decision-making roles as well as grassroots stakeholders. By working through the themes outlined above, social and technical barriers to participating in decision-making, planning, and activities will be addressed. Specific targets will be developed after a brief inception phase. Further details are in Annex 8.

G.3. Financial management and procurement

Funds from GCF will be provided to the MOE's GCF account (as the AE), under the terms of the FAA. MoE will be responsible for financial management and accountable for the use of GCF resources. Financial transactions will be subject to annual audits undertaken by internationally certified auditors. In addition, as the AE, MoE will: i) ensure that the project is executed in accordance with GCF standards; ii) supervise,

oversee and manage the implementation of project interventions; iii) report on Project progress; and iv) ensure that Project activities are well coordinated and aligned with countries' national priorities. MoE will provide oversight to the project consisting of a) entering into a subsidiary agreement with the EE (RFA); b) managing and disbursing GCF funds to the EE, after providing no objection to work plans and budgets; c) reviewing financial expenditures and progress reports; d) overseeing Project implementation in accordance with the Project document and Annual Work Plans and Budgets, agreements with co-financiers and each executing entity rules and procedures; e) providing technical guidance to ensure that the appropriate technical quality is applied to all Project activities; f) providing financial reports to the GCF for Project funds received; g) ensuring that the project complies with the terms agreed in the Project's respective FAA as well as the AMA signed between MoE and the GCF; and h) undertaking regular annual supervision missions according to the MoE's guidelines and convene Project Steering Committee (PSC) meeting twice a year aimed to review progress and approve work plans. The PMU will manage, monitor and report on day-to-day implementation of the EE. The EE will execute the tasks within the overall project management structure: a) implementing day-to-day activities as per the project work plan and budget, including the Environmental and Social Management Plan; b) undertaking procurement activities as per the agreement signed by GCF and AE as well as the sub-agreement signed by the AE and EE; c) managing contracts of suppliers and services providers; d) hiring and managing project staff relevant to the EE-managed project areas; e) implementing activities as per the project work plan; and f) carrying out financial and technical monitoring of activities, including the achievement of outputs and outcomes the EE are in charge of. The EE will enter into a Memorandum of Understanding with different partner agencies that will provide technical know-how to the implementation of the project activities. Procured parties will be contracted in accordance with MoE rules and regulations of procuring goods and services. The financial management structure of the project is built on the Permanent Secretary of MoE, the Project Coordinator/ Chief of Party and the Finance Management Specialist at the PMU level who will oversee and monitor the project finances with project directors and finance managers from the EE (RFA).

The project will be executed by Rwanda Forestry Authority (RFA), a Rwanda government entity affiliated to the Ministry of Environment with a semi-autonomous legal entity. RFA has transparent and accountable financial management systems in place, which are essential elements for the effective, accountable management of the project. RFA will follow the Government of Rwanda procedures for planning, budgeting, and accounting, which are outlined in the law n° 12/2013/ol of 12/09/2013 on state finances and property, and ministerial order n°001/16/10/tc of 26/01/2016 relating to financials; and supporting operational manuals issued by the Ministry of Finance.

The MoE shall ascertain that the EE has in place efficient internal control systems, review financial reports and proceed funds disbursements and will also periodically inspect the project for compliance as well as coordinate audits exercises for the EE. RFA will enter into agreements with MoE that outline general modalities of the funds management in line with GCF grant requirements and RFA's policies. GCF funds will be transferred to an RFA designated bank account. Funds will be disbursed to the EE based on agreed annual work plans and budgets, and its reporting will be on a quarterly basis. The project financial processes will rely on the EE's charts of accounts, internal control systems, disbursement plans, budgeting, expenditure management and accounting, reporting, and assets management as assessed by MoE. Procurement regulations embed the principles of fairness, transparency, accountability and the promotion of competitive economy and efficiency. The Project will be audited annually and commissioned by the Accredited Entity (MoE) to produce certified financial statements and reports to ascertain that GCF funds are well managed. The project will maintain a regularly updated record of all assets and documents that will be retained for at least 5 years after the end of the project.

G.4. Disclosure of funding proposal
☒ No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

(f) ANNEXES		
H.1. Mandatory annexes		
☒	Annex 1	NDA no-objection letter(s)
☒	Annex 2	Feasibility study - and a market study, if applicable
☒	Annex 3	Economic and/or financial analyses in spreadsheet format
☒	Annex 4	Detailed budget plan
☒	Annex 5	Implementation timetable including key project/programme milestones
☒	Annex 6	E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3): ☒ Environmental and Social Impact Assessment (ESIA) or ☒ Environmental and Social Management Plan (ESMP) or ☐ Environmental and Social Management System (ESMS) ☐ Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People's Plan, Land Acquisition Plan, etc.)
☒	Annex 7	Summary of consultations and stakeholder engagement plan
☒	Annex 8	Gender assessment and project/programme-level action plan
☒	Annex 9	Legal due diligence (regulation, taxation and insurance)
☒	Annex 10	Procurement plan
☒	Annex 11	Monitoring and evaluation plan
☒	Annex 12	AE fee request
☒	Annex 13	Co-financing commitment letter, if applicable
☒	Annex 14	Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule
H.2. Other annexes as applicable		
☒	Annex 15	Evidence of internal approval
☐	Annex 16	Map(s) indicating the location of proposed interventions
☐	Annex 17	Multi-country project/programme information
☐	Annex 18	Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
☒	Annex 19	Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
☐	Annex 20	First level AML/CFT (KYC) assessment
☒	Annex 21	Operations manual (Operations and maintenance)
☒	Annex 22	Assessment of GHG emission reductions and their monitoring and reporting (for mitigation and cross cutting-projects)