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

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).
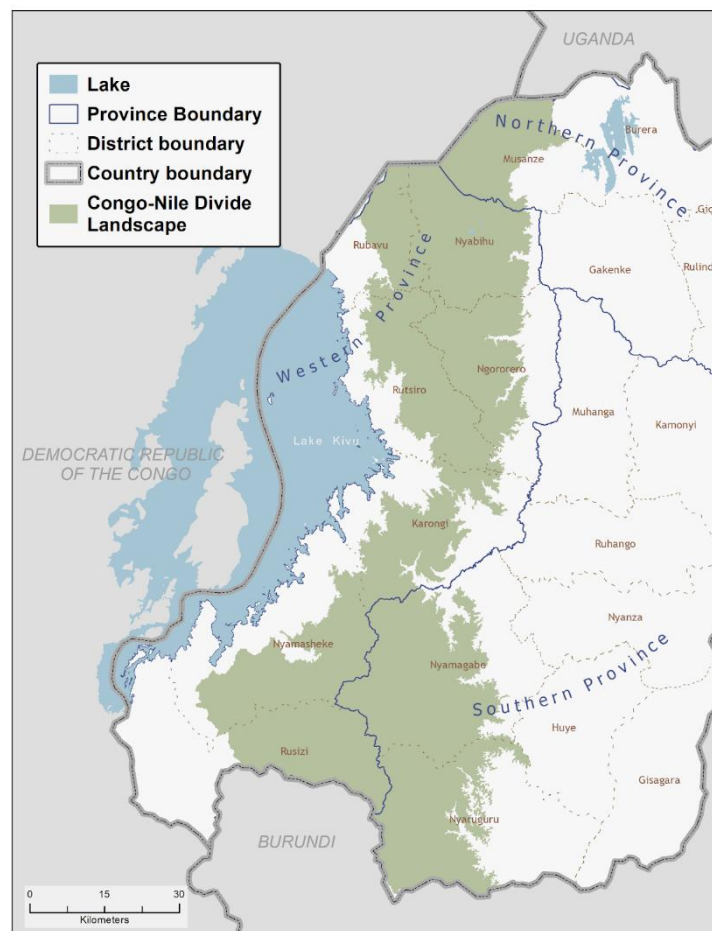

Figure 1 - Map of CND Landscape

According to the 5th Rwanda Population and Housing Census completed in 2022.[1]The CND landscape districts support 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/km². Average size of CNDL households is 4.2 while women account for 52.2%. The total population in landscape implementation sectors defined during feasibility studies as shown below is 1,598,536.
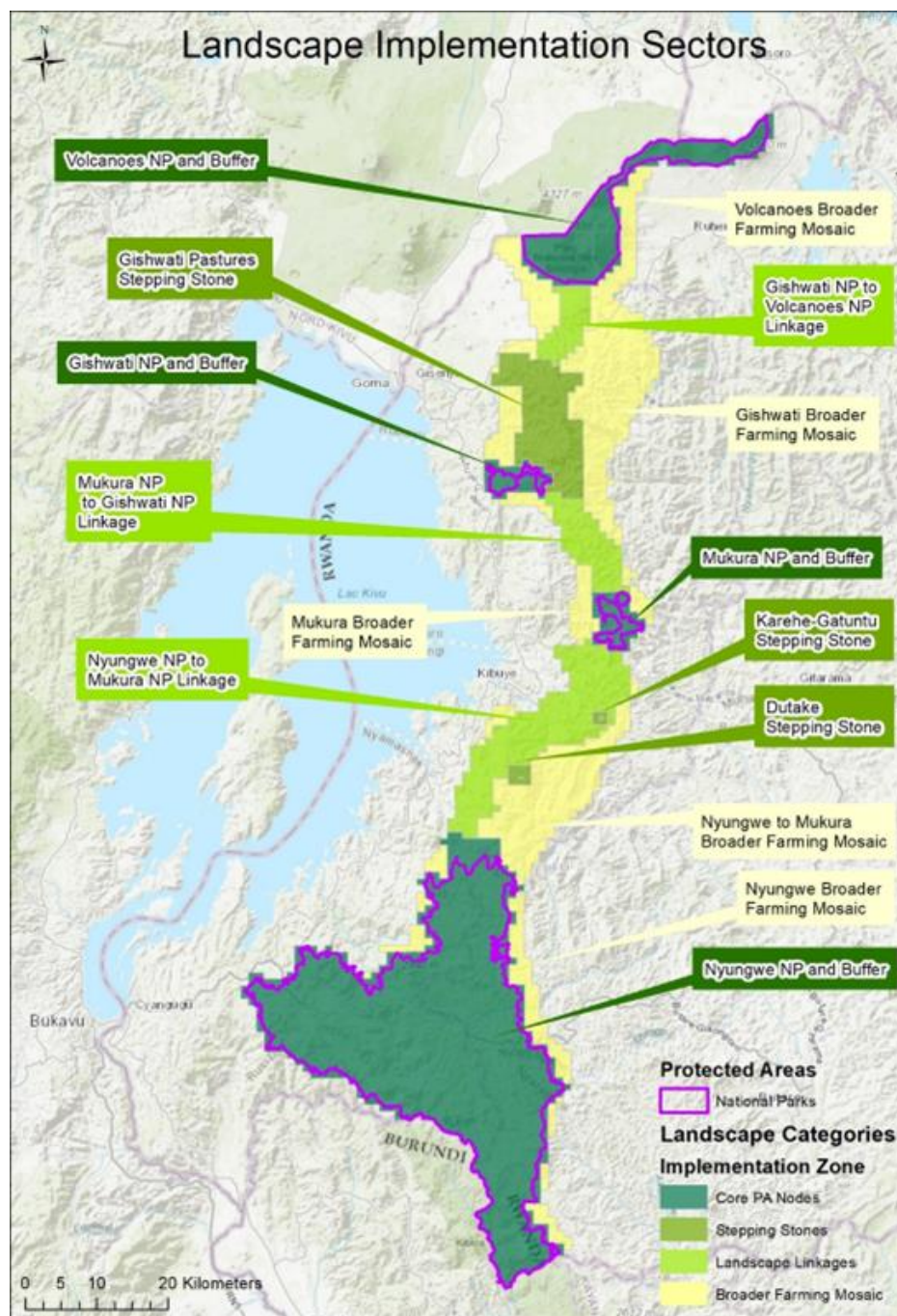

Figure 2. Landscape implementation sectors

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

Direct beneficiaries of this project are referred here to as those who will participate directly in the project, and thus benefit from its implementation. Beneficiaries include all persons who will be employed by the project (except EE staff, consultants and implementation and contractual organisations), participants of the meetings and training workshops, campaigns and following the radio program, receiving grants, equipment, terraces and tree seedlings are considered as direct beneficiaries of this project. The level of beneficiary of this project are individual households, who can be in a cooperative or a business community group, or representing institutions such as government institutions, NGOs, etc. We also considered those who are dependent of household direct beneficiaries as direct beneficiaries and were calculated based on the average size of household (4.2 individuals)[2].

Indirect beneficiaries broadly refer to all human populations living within the CNDL districts.

Detailed estimations of direct beneficiaries are presented with details on methodology for the calculation.

Table 1. Detailed estimation and description of methodology to calculate beneficiaries per project outputs and activities

Activity	Total Number of beneficiaries (of which at least 50% female)	Comments / Methodology for estimation
Output 1.1 Landscape-wide land-use plan developed for climate-resilient livelihoods & forest ecosystems, integrating district strategies		
Activity 1.1.1 Synthesize & disseminate information on value of natural forests & ecosystem services	**1,253,805** Unique beneficiaries of which **654,198** are females	A. 1,598,536 communities of CNDL*78,4% average population that owning a radio in the CNDL districts =**1,253,252** people benefiting from the education and outreach program on gender and climate issues, climate risks, value of forests and forests ecosystems, climate adaptation options through radio program B. **330** Local government, youth, women, HM, CSO, farmers representatives @ district level (30 people *11 workshops) (accounted for 1.1.1 A.) C. **100** Representatives of key Ministries, government organisations, NGOs, and community organisations @ National level (50 people* 2 workshops) D. **40** people: Technical team from key ministries, Government institutions, CSOs E. **200** people from National women/youth groups that will conduct climate literacy

		training workshops for local women and youth groups. F. **15** Youth employed to assess changes in Knowledge, attitude, and behaviour related to gender and climates issues, climate risks, value of forests and forests ecosystems, climate adaptation options in CND communities (Accounted in activity 1.1.1A) G. **5** journalists to implement a radio program to raise awareness and educate communities on climate risks, value of forests and forests ecosystems, climate adaptation options etc H. **208** radio guests/experts depending on the program themes.
Activity 1.1.2 Develop climate-resilient landscape land-use plan		A. **20** people: Technical team from key ministries, Government institutions, CSOs (already accounted in activity 1.1.1) B. **195** people involved in planning in CND sectors, districts, and provinces CSOs (already accounted in activity 1.1.1) C. **100** Local government, youth, women, HM, CSO, farmers representatives @ district level (20 people *5 meetings) (already accounted in activity 1.1.1) D. **100** Representatives of key Ministries, government organisations, NGOs and community organisations @ National level (already accounted in activity 1.1.1) E. **15** people from the task force (already accounted in activity 1.2.1)
Output 1.2 Local & national institutional capacities strengthened to integrate biodiversity & climate risks into land use planning & management		
Activity 1.2.1 Create interagency taskforce institutionalising integrated landscape planning & policy	**312** unique beneficiaries of which **164** are females	**15** Inter-agency taskforce members representing key government institution, CSOs and Ministries
Activity 1.2.2 Build capacity for spatial planning in national agencies re climate change		**415** Authorities and technical staff of MoE, REMA, NLA, RFA, high learning institutions, people from community of practice and other key stakeholders **Assumption**: 40% overlap between Activity 1.2.2 and output 1.1

Activity 1.2.3 Develop an effective forest monitoring system to underpin forest management decisions		**60** Technical team from key ministries, Government institutions, CSOs &UR **Assumption:** 20% overlap between Activity 1.2.3 and output 1.1 and 1.2

Output 2.1 PA management effectiveness improved re climate risks & adaptation		
Activity 2.1.1 Facilitate revision of PA management plans to address climate risks		35 trained park staff from 3 National Parks
Activity 2.1.2 Establish long-term plans for CND financial sustainability post-GCF	**105** unique beneficiaries of which **32** are females	
Activity 2.1.3 New fire management curriculum developed and operationalized		**25** RDB head rangers trained trainers in fire prevention & fighting & leadership whole program **15** park senior fire detection, early warning, fire rating system 30 RFA and district staff **104** head of community fire brigades (accounted in output 1.1) 1200 people/event*2 sites per year*4 years=**9,600** (accounted in output 1.1)

Output 2.2 Natural forest cover restored, biodiversity connections established		
Activity 2.2.1 Secure key remaining natural areas outside Pas		
Activity 2.2.2 Restore natural forest cover in & outside PAs including riparian linkages		3000 people hired for ANR in Nyungwe *4.2 people/HH=**12,600 people** already accounted in activity 1.1.1 150 people to remove exotic trees and 250 to provide and plant indigenous tree species in GMNP*4.2 people/HH=**1,680 people** already accounted in activity 1.1.1 1500Ha of riparian linkages/0.37[3]Ha average land size in CND districts*4.2 people/HH= **17,027 people and include 820 workers (**already accounted in activity 1.1.1)

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

Activity 2.2.3 Promote silvo-pastoralism with indigenous trees in Gishwati Pasture areas		1000Ha of pastureland/2Ha average size per HH*4.2 people per HH= **2,100 people** including **546 workers** (already accounted in activity 1.1.1)
Output 3.1 Farming methods enhance productivity, reduce erosion & flooding risks, contribute to ecosystem services, and support connectivity		
3.1.1 Restore high slope areas (>55%) as protective forests		On average it takes 100 man-days to restore 1ha of protected forests[4] *2500ha over 6 months (183 days); landowners are also included +4 casual workers for mapping=1370 people*4.2/HH=**5,755 people** (Already accounted in activity 1.1.1)
3.1.2 Develop on-farm agroforestry for high caloric and indigenous tree species		On average 1500 man-days complete 1ha of new terraces and 300 man-days rehabilitate 1ha of existing terraces. If 1673 ha new terraces and 1673 ha of existing terraces must be completed in 183 days equivalent to 6 months; 13,713 people will be employed for new terraces and 2,743 for rehabilitation of existing terraces = 16,456 people and include landowners*4.2/HH= **69,115 people** (Already accounted in activity 1.1.1)
Output 3.2 Rural livelihoods generate alternative incomes & reduce pressure on forests		
Activity 3.2.1 Develop forest and agroforestry related value chain for markets access		25 new business employing at least 5 people + 900 farmers involved in agriculture value chains ie 4000 Beekeepers*4.2= **21,105 people** (Already accounted in activity 1.1.1) 500 People employed to develop tourism facilities +20 Guides and camps help*4.2/HH= **2,184 people** (Already accounted in activity 1.1.1)
Activity 3.2.2 Facilitate & scale up capacity, value addition & marketing of select climate-resilient value chain products		
Activity 3.2.3 Facilitate access to input & output markets for vulnerable farmers		
Activity 3.2.4 Scale up marketing, production, sales, use of fuel-efficient cookstoves		**8,500** EES beneficiaries accounted for agroforestry and riparian land afforestation of 50 youth entrepreneurs in EES business. (Already accounted in activity 1.1.1)
Output 3.3 Financial services & private sector investment increased		
Activity 3.3.1 Facilitate access to finance & private sector investments	**20** unique beneficiaries of which **10** are females	
Activity 3.3.2 Set up & support savings & loan groups, enhance asset-building		6,900 the poorest HH, landless that are not beekeepers, nor the 900 farmers involved in VC* 4.2/HH=**28,980 people**

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[4] Source: RFA

		(Already accounted in activity 1.1.1)
Activity 3.3.3 Build capacity of financial institutions to serve targeted value chains & communities		**20 loan officers**
Total direct beneficiaries country	**1,254,242**	
Females	**654,404**	Total of unique beneficiaries
Total direct beneficiaries CNDL	**1,253,252**	
Females CNDL	**654,198**	
Indirect beneficiaries CNDL	**2,809,381** **(1,466,497 females)**	CNDL population (4,062,633) – Total direct beneficiaries CNDL (1,253,252)
Indirect beneficiaries Country	**9,260,745** **(4,769,284 females)**	The Rwanda Broadcasting Bureau covers 98% of Rwanda territory, 81% households own radio posts and will benefit from the project radio program to increase Rwandans 'knowledge on climate information, climate risks and climate adaptation options. These exclude direct beneficiaries At national level females represent 51.5% of the total population
Adaptation Results Area 1 *Core Indicator 2* *Direct beneficiaries*	**108,277** **(56,521 females)**	Sum of beneficiaries of activity 2.2.2, 2.2.3, 3.1.1, 1.1.2
Indirect beneficiaries	**2,809,381** **(1,466,497 females)**	Indirect beneficiaries are Indirect beneficiaries of the CNDL as defined above
Adaptation Results Area 1 *Supplementary Indicator 2.1* *Direct beneficiaries*	**52,319** **(27,311 females)**	Sum of beneficiaries of activity 3.2.1, 3.2.2, 3.2.4(50) and 3.3.2
Indirect beneficiaries	**2,809,381** **(1,466,497 females)**	Indirect beneficiaries are Indirect beneficiaries of the CNDL as defined above
Adaptation Results Area 2 *Supplementary Indicator 2.2* *Direct beneficiaries*	**1,598,536** **(834,436 females)**	The total population in landscape implementation sectors defined during feasibility studies and shown in figure 2.

Indirect beneficiaries	**2,464,097** **(1,286,259 females)**	CNDL population (4,062,633) – direct beneficiaries of Supplementary Indicator 2.2 (1,598,536)

The project will benefit a total of **1,254,242** direct beneficiaries of which 52,2% are females. Direct beneficiaries represent **30.9%** of the total population of the 10 districts of CNDL and 9.5 % of the population of Rwanda.

Roughly, if direct beneficiaries are discounted from the total population of the 10 districts of CND, it is estimated that 69.1% will benefit indirectly. Nationally 48,7% of the total population (6,452,355) (excluding the direct and indirect beneficiaries from the CND districts) may benefit indirectly thanks to a radio program that will educate and raise awareness on climate risks, value of forests and forests ecosystems, climate adaptation options, access to indigenous and agroforestry quality materials and improved ecosystem services. The total number of indirect beneficiaries is **9,260,745** or 69,9% of the total population of Rwanda.