REPUBLIC OF BURUNDI

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) / BURUNDI

September 2015

1. NATIONAL CONTEXT

Burundi is a landlocked country at the heart of Africa's Great Lakes Region, located between the meridians 29°00'-30°25 East and parallels 2°20°-4°25' South. It has an area of 27,834 km² and belongs to two major river basins: the NileBasin, accounting for 13,800 km² of the country's territory, and the CongoBasin, covering 14,034 km². Its mostly rural population, with an urbanization rate of around 10.4%, was estimated at 8,053,574 at the time of the 2008 census, with an average density of 310 inhabitants/km².

The Burundian economy is dominated by the primary sector, which accounts for nearly half of its gross domestic product (GDP) and close to 80% of its export income; the secondary sector (industry and handicraft) represents just 17-18% of GDP, and the tertiary sector, only about one third of GDP. The current production structure, dominated by subsistence farming, makes the economy very vulnerable and fragile due to its dependency on climate conditions.

Electrical power consumption in Burundi, amounting to 25 kWh/person/year, represents just 4% of the energy balance.

In Burundi, activities relating to climate change were marked in particular by the development and publication of the first and second national communications under the UNFCCC. At the same time, Burundi also prepared its National Adaptation Programme of Action to climate change (NAPA). The actions identified in the NAPA covered the key sectors of the Burundian economy. As various sectoral adaptation and vulnerability assessment studies have shown, climate change affects every sector of the country's economy, particularly agriculture.

The prospects for sustainable ecological growth were defined through Burundi Vision 2025 and translated into a short term action plan as part of the Growth and Poverty Reduction Strategic Framework covering the period of 2012-2015. In the medium to long term, the Government plans to engage in a transition toward a green economy. Burundi Vision 2025 makes a firm commitment to prioritizing the country's protection and rational management of the environment such that Burundians can live in a protected, properly managed setting.

The Government has stated its ***vision*** of the fight against climate change as follows: ***"A State that promotes development that is resilient to the harmful effects of climate change".***

At the institutional level, the Ministry of Water, the Environment, Land Management and Urban Planning, with its departments and personalized institutionssuch asIGEBU and OBPE, handles matters relating to climate change. For the fulfilment of its mission, the Ministry enjoys the support of frameworks for dialogue such as the National Environment Commission, the Sectoral Group on Water, Sanitation and the Environment (GSEAE), the National Water Partnership (PNE-Bu), and the National Platform for Risk Prevention and Disaster Management.

In the framework of its Intended Nationally Determined Contribution (INDC), Burundi intends to reaffirm its determination to contribute to global efforts to reduce greenhouse gas emissions and to strengthen its resilience to climate change while continuing to meet its own development challenges.

2. ADAPTATION

2.1. Climate change impacts and vulnerability

Studies conducted for the initial national communication on climate change and the evolution of climate parameters in Burundi through 2050, based on the general circulation model, show that the average annual temperature will increase by 1°C to 3°C. Rainfall will rise by roughly 10%, and the precipitation regime will be disrupted such that there will only be two seasons remaining, each lasting six months: a rainy season from November to April, followed by a dry season.

These climate changes will engender a large number of risks associated with the following phenomena: (i) season creep; (ii) flooding of swamps and lowlands; (iii) land degradation and loss of soil fertility; (iv) shortage of groundwater resources; (v) extreme weather events (hail, violent showers, heavy winds, etc.); (vi) changes to the growing seasons of crops and forests; and (vii) unpredictable movements of pests.

According to an integrated analysis of Burundi's vulnerability, conducted as part of the ACCES (Climate Change Adaptation for Soil and Water Resources Conservation) Project, it was found that the country's "hotspots of vulnerability" are located in the north and northwest. The slope of the ridge (and not the ridge itself) leading to the Imbo Plain to the west, the topographical structures to the north and the central plateau are the regions most vulnerable to erosion. The main causes are the highly variable relief and the pronounced sensitivity of those regions to climate variability.

Table 1: Major impacts relating to climate change in Burundi (Source: NAPA 2007)

Sector	*Impacts*
Water	▪ Drying up of lakes and other waterways, and disappearance of aquatic flora ▪ Deterioration of surface water quality ▪ Increased rainwater erosion and silting of certain rivers ▪ Decline in production by hydroelectric power plants ▪ Increased competition for the use of unpolluted groundwater resources
Energy	▪ More frequent shutdowns of certain active hydroelectric power plants because of exceeding operating thresholds due to insufficient rainfall and prolonged drought ▪ Complete silting of certain dams due to heightened erosion caused by more abundant precipitation leading to the complete shutdown of a few hydroelectric power plants, the most endangered among them being the Marangara, Buhiga and Kayenzi plants ▪ More frequent flooding of electricity production infrastructure like in Mugere, leading to production shutdowns for longer periods of time ▪ Increased runoff from land degradation in the hydroelectric power plants' watersheds ▪ Major fluctuations in electricity production due to stresses on the water supply system and changes in rainfall patterns ▪ A larger deficit in the electricity sector leading to real electrical power supply problems in the country's various socioeconomic domains ▪ Widespread scarcity of firewood and wood charcoal due to heightened, combined pressure from human activities, rising temperatures and changes to biomass growth rates
Agriculture and livestock farming	▪ Declines in harvests, cattle, goats, sheep and poultry aggravated by more prolonged, more frequent drought with likelihoods of occurrence of between 40% and 60%

	▪ Meat and dairy production yields will be even more heavily affected and reduced, along with fish production in the event of drought ▪ Lightning appearing during tornadoes will increase, causing additional livestock deaths in mountainous areas ▪ Decline in the quality and quantity of pastureland
Health	▪ Increased number of cases of malaria
Landscapes	▪ Risk of more frequent, larger scale flooding of lowlands ▪ Escalation of soil erosion along groundwater trenches in the watersheds of the MirwaMountains ▪ The levels of Lakes Cohoha, Rweru, Rwihinda and Kanzigiri in the Bugesera Depression could further decrease with the intensification of drought, with their waters retreating at above 400 m, which has already been seen toward the centres of those lakes and puts some of the shallower ones at risk of completely disappearing ▪ The level of Lake Tanganyika will rise due to heavy precipitation
Terrestrial ecosystems (forests)	▪ Disappearance of the subalpine zone starting at an elevation of 2,450 m ▪ Disappearance of certain plant species and aggravation of erosion and bush fires ▪ Degradation of the groves in Bugesera and forests of Hyphaene palm trees on the Ruzizi Plain, with an increased vulnerability to bush fires

2.2. Adaptation needs

To reduce Burundi's vulnerability and boost its resilience, the country's needs have been identified. These relate to human, institutional, technical and financial capacity-building, as well as technology transfers.

a) Human and institutional capacity-building needs

The country needs to:

- Inform, educate and communicate about the climate, climate risks and adaptation technologies (development of the population's reactivity);
- Strengthen the aptitudes of actors (especially women and farmers) in new technical processes, in the interest of intensified, sustainable production methods (new crop systems and techniques);
- Encourage technology transfers between research institutes and agro-sylvo-pastoral actors;
- Support institutions in defining adaptation priorities by socioeconomic sector and foster inter-sectoral consistency, namely during the development of the National Adaptation Plan.

b) Technical and technology transfer needs

Need	Objectives and Description
Key measure: Development of access to water while enhancing the efficiency of its use	
Water resources control and management	- Develop, rehabilitate and manage hydroagricultural developments - Produce developments for rain-fed crops - Develop small and large scale irrigation and improve its efficiency in order to reduce water consumption
Key measure: Promotion of intensified water-efficient agriculture	
Intensification and diversification of agricultural production	- Intensify and diversify agricultural production by simplifying access to inputs (fertilizer, subsistence crop seeds, drought-resistant fodder and crop protection products) and to agricultural equipment - Develop an agro-ecological approach (soil fertility management practices, use of manure and compost, development of agroforestry, and water and soil conservation)
Key measure: Security for animal and fishing production, and promotion of associations	
Security for livestock farming and support for the association of agriculture and livestock	- Enable the diversification of activities (breeding of multiple species of animals, combination of agriculture and livestock, sale of harvest transport services, fodder crops, etc.) - Facilitate the genetic diversity of different animals
Support for the exploitation of fishing resources	Develop the exploitation of fishing resources while conserving resources (stocking bodies of water with fish, development of rain-fed fish farming and application of zones closed to grazing)
Key measure: Support for facilities that use renewable energy sources	
Improvement of the population's well-being	Improve agricultural and livestock production activities (drainage, conservation, drying and cold chain) including the use of renewable energy sources (hydraulic, solar and wind)
Key measure: Communications on climate risks and adaptation scenarios	
Knowledge of spatial and temporal changes to the environment	- Track weather forecasts and the climate - Prevent and fight bio-aggressors - Use information networks to identify areas ravaged by disease and/or with major water and pastureland resources

2.3. National priorities for adaptation to climate change

Specifically concerning adaptation to climate change, the priorities are outlined in the following documents:

- National Adaptation Programme of Action (NAPA, 2007);
- National Climate Change Policy (2012);
- National Strategy and Action Plan on Climate Change (2012).

Table 2: Sectoral policies and strategies in place for adaptation to climate change

Sector	Current Policy and Strategy Documents	Priorities
Water	▪ National Water Resources Management Policy and Action Plan (2001) ▪ Water Code (Law 1/02 of 26/03/2012 enacting the Water Code in Burundi)	▪ Water control with a view to increasing agricultural and livestock production ▪ Human resources capacity-building in the field of water
Energy	▪ Sectoral Strategy for the Energy Sector in Burundi (2011) ▪ Law 1/13 of 23 April 2015 reorganizing the electricity sector in Burundi	▪ Hydroelectrical production through developments adjusted to align with the successive growth phases of the Burundian economy
Forestry	National Forestry Policy of Burundi (2012)	▪ Development and rational management of forest resources: raising the forest cover rate to 20% by 2025 ▪ Promotion of forest resources ▪ Human and institutional capacity-building
Agriculture & Livestock	1. National Agricultural Strategy, 2008-2015 (2008) 2. National Sustainable Land Use Strategy (2007) 3. National Action Programme to Fight Land Degradation (2005)	▪ Increase in agricultural production and productivity and development of sustainable production systems than can re-establish food self-sufficiency in the short and medium terms ▪ Management and sustainability capacity-building in the agricultural sector in order to transform subsistence farming into profitable market agriculture managed by professionals ▪ Introduction of smart agriculture

2.4. Priority adaptation programmes

The following programmes were identified as part of the National Strategy and Action Plan on Climate Change (2012):

Programme name	Components
Climate risk adaptation and management	Integrated water resources management by a small hydrological unit Integrated management of climate risk and forecasts over time (by means of probabilities and forward-looking studies) so as to be able to take action in advance Protection of aquatic and land-based ecosystems Coaching of the population to develop their resilience to climate change Development of institutional and operational capacities to coordinate programmes that are resilient to climate change Research on the vulnerability and adaptation of socioeconomic sectors to climate change Establishment of functional monitoring and evaluation mechanisms for climate change, as well as knowledge management and information mechanisms Research and extension of drought-resistant forest species Promotion of climate-smart agriculture (agrometeorology)
Capacity-building, knowledge management and communication	Enhancement of data and information management and distribution mechanisms Reinforcement of climate change impact tracking systems by means of observations and investigations Improvement of scientific and technological research on adapting to climate change, supported by climate observations Improvement of the legislative and regulatory framework for handling climate change as part of investment programmes and the promotion of public-private partnerships Strengthening of the information and data communication and exchange system

2.5. Current initiatives to support adaptation

- ACCES (Climate Change Adaptation for Soil and Water Resources Conservation) Project, financed by the Special Fund for Energy and Climate
- Watershed Management and Climate Resilience Improvement (PABVARC) Project
- Communication and Early Warning Strategy for Adaptations to Climate Change
- Integration of smart agriculture into the National Agricultural Investment Programme (NAIP)
- National Action Plan (currently being drafted)
- Various GEF small grants projects

3. MITIGATION

In terms of mitigation, the desired INDC for Burundi should make it possible to meet the sustainability objectives defined in national policies and strategies.

		Expected rate of reduction
Type of contribution	*Unconditional contribution*	> Reduction of greenhouse gas emissions by 3% compared to the business-as-usual (BAU) scenario for 2030
	Conditional contribution	> Reduction of greenhouse gas emissions by 20%, beginning in 2016, compared to the business-as-usual scenario for 2030
Baseline year		> 2005
Target year		> 2030
Total reduction in emissions by 2030		> 1,958 Gg CO_2e for the unconditional objective and 14,897 Gg CO_2e for the conditional objective

3.1. Business-as-usual scenario and emissions reduction objectives

The table below presents the emissions for the baseline year and the business-as-usual (BAU) scenario, the emissions for the unconditional objective and the emissions for the conditional objective, whose implementation will depend on the financial support of the international community.

a) Unconditional objective

Under the National Reforestation Programme, Burundi has undertaken to increase its carbon dioxide gas well through 4,000 hectares of annual reforestation over the course of 15 years, beginning in 2016.

In the energy sector, Burundi is in the process of building three hydroelectric power plants. This programme will increase the country's electrification rate to 35%.

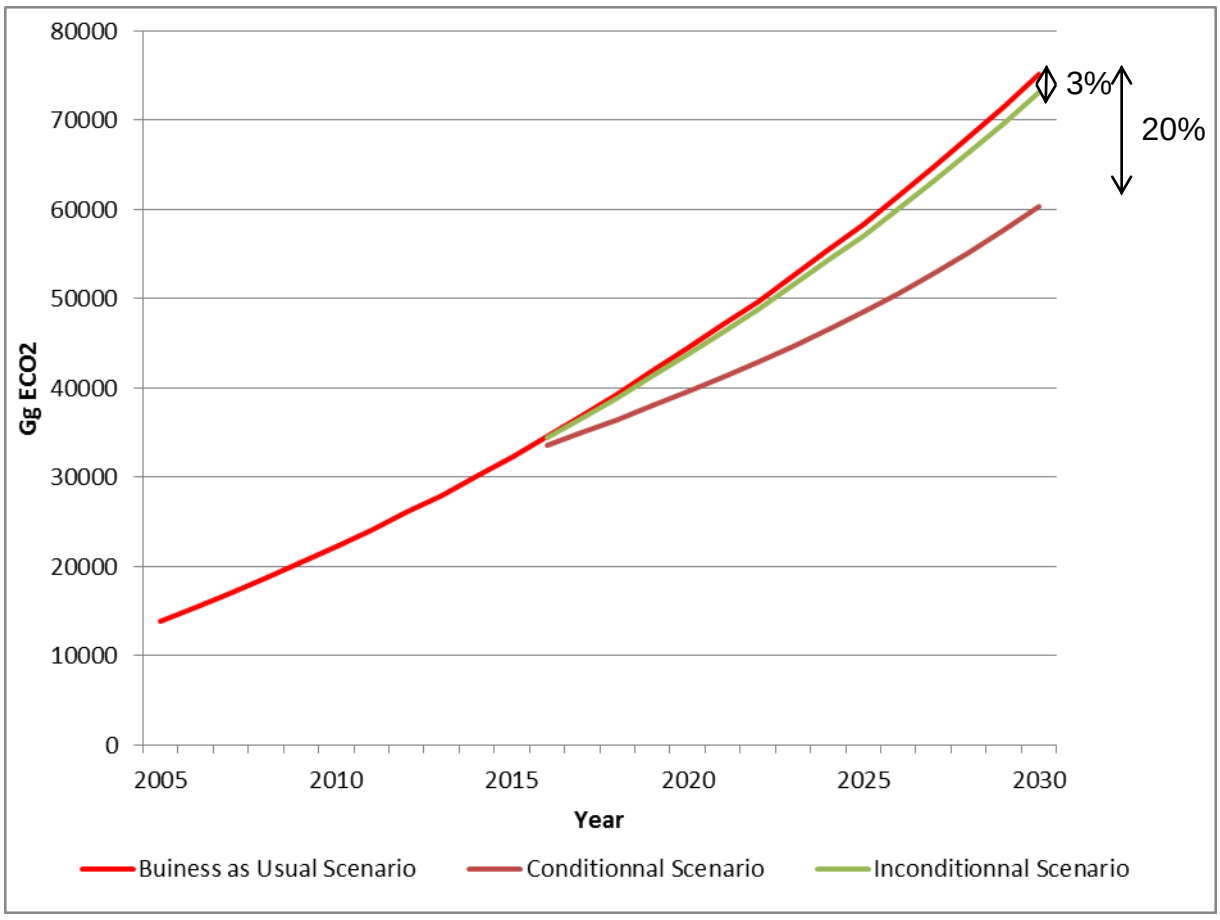
b) Conditional objective

- Forestry: (i) reforestation of 8,000 ha/year during 15 years, beginning in 2016; (ii) replacement of 100% of traditional charcoal kilns and traditional home ovens by 2030;
- Agriculture: gradual replacement of 100% of mineral fertilizers with organic fertilizer by 2030.

Table 3: Emissions by mitigation objective

OBJECTIVE	Percentage	CO_2e emissions (Gg)
Unconditional objective (2030) %	**3%**	1,958
Conditional objective (2030) %	**20%**	14,897
Unconditional objective (2025) %	2%	1,305
Conditional objective (2025) %	17%	9,897
Unconditional objective (2020) %	1%	653
Conditional objective (2020) %	11%	4,897

Mitigation objectives for 2030



3.2. Scope and scale of the contribution

Table 4: Scope and scale of the contribution

Sector	Gas(es)	Sub-sector(s)	Geographic scope
Energy	CO_2, CH_4 and N_2O	Fuel combustion activities	Nationwide
Agriculture & livestock	CH_4 and N_2O	Agricultural soils	Nationwide
Land use and forestry	CO_2	Forestland	Nationwide

3.3. Assumptions and methodology

The choice of assumptions is guided by the development planning orientations defined in Burundi Vision 2025 and the national operationalization policies and strategies for the Vision.

The GHG inventories were performed on five modules identified by the IPCC: Industrial Processes, Energy, Agriculture, Land Use, Land Use Change and Forestry (LULUCF), as well as the Waste module.

100 years of GWP values were used for the conversion to CO_2 equivalents (IPCC Assessment Report). These numbers were 21 for CH4 and 310 for N_2O.

The policy documents that take GHG emissions generating activities into consideration - and that were used to formulate the assumptions and objectives - appear in Table 5.

Table 5: Documents used to formulate assumptions and objectives

Sector	Current Policy and Strategy Documents
Energy	Sectoral Strategy for the Energy Sector in Burundi (2011) National Environment Strategy (SNEB, 1997)
Land use and forestry	National Forestry Policy of Burundi (2012) National Strategy and Action Plan for Biodiversity (2013-2020)
Agriculture	National Agricultural Strategy, 2008-2015 (2008) National Sustainable Land Use Strategy (2007) National Action Programme to Fight Land Degradation (2005) National Strategy and Action Plan to Fight Soil Degradation (2011-2016) National Agricultural Investment Plan (2012-2017)
	Vision Burundi 2025 Strategic Framework for Growth (2012)
All sectors	First and second national communications on climate change (2001 and 2010) National Adaptation Planof Action to climate change (2007) Summary report on greenhouse gas inventories (2009) Summary report on GHG emissions mitigation studies (2009) National Climate Change Policy (2013) National Strategy and Action Plan on Climate Change (2013)

3.4. Emissions compensation

In terms of compensation for any loss of revenue or for the restriction of certain economic activities due to the implementation of the INDC programme, Burundi will rely on international greenhouse gas emissions compensation mechanisms and on current national legislation.

In terms of forestry in particular, the plan is to promote the development of ecosystem services.

3.5. Verification/counting methods

Concerning carbon counting and verification methods, Burundi will conform to the IPCC's guidelines.

3.6. Ambitious, equitable nature of the planned contribution

Limiting the rise in GHG emissions presents a major challenge for Burundi, in view of its national context. Economically, Burundi is ranked a least developed country (LDC), with per capita GDP ofUS $282 (in 2012).

Burundi also has significant structural vulnerability due in particular to the country's landlocked status and its exposure to weather and natural hazards. According to United Nations statistics, Burundi's economic vulnerability index is 56.81 compared with an average of 45.7 in 2012 across all of the least developed countries. Faced with these development challenges, Burundi's contribution is an ambitious one, as it

plans for a 3% reduction in its emissions by 2030 for the unconditional scenario, and by 20% by that same year for its conditional objective.

4. CONTRIBUTION IMPLEMENTATION METHODS

4.1. Institutional arrangements for implementation

The Government of Burundi will implement the INDC through the Ministry of the Environment, which is the government institution in charge of ensuring the implementation of international conventions relating to the environment. It will used its customized departments and institutions like IGEBU and the OBPE, which handle questions associated with climate change, but also frameworks for dialogue such as the National Environment Commission, the Sectoral Group on Water, Sanitation and the Environment (GSEAE), the National Water Partnership (PNE-Bu), and the National Platform for Risk Prevention and Disaster Management.

4.2. Capacity-building

Despite the non-negligible step already taken to create and build capacities, national experts are still insufficient and have not yet acquired significant proficiency in the tools and methodologies available to produce GHG emissions inventories, climate change vulnerability and adaptation studies, and GHG emissions mitigation studies, as well as solid proficiency in the procedures used to compile financing applications for the available funding mechanisms. As a result, capacity-building will be needed to offset the following:

- Insufficient climate data due to outdated facilities;
- Insufficient scientific personnel able to satisfactorily run programmes and research topics linked to climate change;
- Difficulty training technical and scientific personnel on-site or abroad due to the non-existence of training institutions specializing in climate in Burundi and limited cooperation with the outside world;
- Insufficient quality and quantity of domestic technical expertise.

4.3. Technology transfer needs

Burundi does not have the technical resources to do research and development in the field of climate change and has no national programme on the subject. As part of the INDC's implementation, Burundi's technology transfer actions will pertain to:

- Promoting research and development, adopting new technologies, and harnessing them for the national context;
- Reinforcing the operations of certain organizations and institutions involved in climate change;
- Skills training, education and international cooperation.

4.4. Consideration of gender, youth and vulnerable groups

Gender, youth and vulnerable groups are concerns that have not always been taken into account in Burundi's national and sectoral socioeconomic development plans. In its Vision 2025, the Government of Burundi considers these to be cross-cutting issues to be incorporated into all development programmes. The same will apply to implementation of the INDC.

4.5. Need for financial support

As was underscored above, most of the climate change adaptation actions identified in previously developed national and sectoral action plans have not yet been implemented for want of the financial means to do so. The table below summarizes the financial needs for implementation of the INDC in the form of programmes.

Table 6: Programmes and costs associated with implementation of the INDC (Source: National Strategy and Action Plan on Climate Change, 2012)

Programme Name	Components	Cost (in US$K)
Climate risk adaptation and management	▪ Integrated water resources management by a small hydrological unit ▪ Protection of aquatic and land-based ecosystems ▪ Coaching of the population to develop their resilience to climate change ▪ Development of institutional and operational capacities to coordinate programmes that are resilient to climate change ▪ Research on the vulnerability and adaptation of socioeconomic sectors to climate change ▪ Establishment of functional monitoring and evaluation mechanisms for climate change, as well as knowledge management and information mechanisms ▪ Research and extension of drought-resistant forest species	3,719
Mitigation of greenhouse gas emissions and low carbon developments	▪ Development of hydroelectricity ▪ Decentralized rural electrification through the use of photovoltaic systems ▪ Energy efficiency in production, transport, distribution and consumption (reduction of losses, low energy light bulbs and energy saving equipment) ▪ Peat carbonization, and densification and carbonization of coffee husks, rice hulls and sawdust ▪ Distribution and dissemination of improved ovens ▪ Intermittent drainage in rice cultivation ▪ Composting of waste from the defoliation of sugar cane plantations ▪ Recovery of the fermentable fraction of urban waste that can produce compost and biogas ▪ REDD pilot programme	1,446,118

Promotion of research & development and technology transfers	▪ Development of small scale hydro-power (Pico hydro, water wheels, etc.) ▪ Resumption of research and development, distribution and extension of renewable energies (biogas, wind power and gasification) ▪ Urban waste recovery techniques ▪ Urban transit with low GHG emissions ▪ Adaptation of agriculture to climate change ▪ Waste recovery techniques for agriculture, forestry and livestock farming	25,787
Capacity-building, knowledge management and communication	▪ Improvement of sustainable forest and reforestation management methods and techniques ▪ Enhancement of data and information management and distribution mechanisms ▪ Reinforcement of climate change impact tracking systems ▪ Improvement of scientific and technological research on mitigating and adapting to climate change ▪ Design and set-up of a national REDD monitoring, reporting and verification mechanism, plus other actions relating to climate change ▪ Improvement of the legislative and regulatory framework for handling climate change as part of investment programmes and the promotion of public-private partnerships ▪ Strengthening of the information and data communication and exchange system	3,465
Reforestation and agroforestry[1]	▪ Reforestation of terrains on steep slopes ▪ Colonization of terrains on mild slopes through agroforestry	10,000
Extension of improved kilns[1]	▪ Training of charcoal producerson building and using improved kilns	1,500
Extension of improved domestic and artisanal ovens[1]	▪ Training of craftsmen on producing improved ovens (metal and pottery) ▪ Awareness raising and promotion of improved ovens for the home and crafts industries (brickworks, tile factories, restaurants, etc.)	3,000

[1]Communal forest management plan (MEEATU/PPCDR, 2013).

ANNEX: List of Acronyms and Abbreviations

ACCES:	Climate Change Adaptation for Soil and Water Resources Conservation Project
CC:	Climate change
CDM:	Clean Development Mechanism
CO_2e:	Carbon dioxide equivalent
GDP:	Gross domestic product
Gg CO_2e:	Gigagram of carbon dioxide equivalent
Gg:	Gigagram
GHGI:	Greenhouse gas inventory
GSEAE:	Sectoral Group on Water, Sanitation and the Environment
IGEBU:	Geographic Institute of Burundi
INDC:	Intended Nationally Determined Contribution
INECN:	National Institute for the Environment and Nature Conservation
IPCC:	Intergovernmental Panel on Climate Change
LULUCF:	Land use, land use change and forestry
MEEATU:	Ministry of Water, Environment, Land Management and Urban Planning
NAPA:	National Adaptation Programme of Action
OBPE:	Burundian Office for the Protection of the Environment
SFPR:	Strategy Framework for Poverty Reduction
UNFCCC:	United Nations Framework Convention on Climate Change