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Report No: PCBASIC0073104

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF SDR 20.6 MILLION
(US$30 MILLION)

TO THE

REPUBLIC OF BURUNDI

FOR A

BURUNDI LANDSCAPE RESTORATION AND RESILIENCE PROJECT

MARCH 20, 2018

Environment and Natural Resources Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective Jan 31, 2018)

Currency Unit =	Burundi Franc (BIF)
SDR 0.68628528 =	US$1
US$ 1.45712 =	SDR 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

APDH	Association for Peace and Human Rights (*Association pour la Paix et les Droits de l'Homme*)
B/C	Benefit-Cost
BLRRP	Burundi Landscape Restoration and Resilience Project
CBO	Community-Based Organization
CEA	Country Environmental Analysis
CERC	Contingency Emergency Response Component
CLS	Communal Land Service (*Service Foncier Communal*)
DA	Designated Account
ERR	Economic Rate of Return
ESMF	Environmental and Social Management Framework
EX-ACT	EX-Ante Carbon-Balance Tool
FAO	Food and Agriculture Organization (of the United Nations)
FFS	Farmer Field School
FLR	Forest Landscape Restoration
FM	Financial Management
FMS	Financial Management Specialist
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIS	Geographic Information System
GoB	Government of Burundi
GRM	Grievance Redress Mechanism
IAP	Integrated Approach Pilot
IFAD	International Fund for Agricultural Development
IFR	Interim Financial Report
IGEBU	Institute of Geography of Burundi (*Institut Geographique Du Burundi*)
IPF	Investment Project Financing
IPM	Integrated Pest Management
ISABU	Institute of Agronomic Sciences of Burundi (*Institut des Sciences Agronomiques du Burundi*)
ISR	Implementation Status and Results Report
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LRLC	Local Reconnaissance Land Commission (*Commission de Reconnaissance Collinaire*)

LRW	Land Husbandry, Water Harvesting and Hillside Irrigation Project
LVEMP	Lake Victoria Environmental Management Project
M&E	Monitoring and Evaluation
MCA	Multicriteria Analysis
MEEATU	Ministry of Water, Environment, Land, and Urban Planning
MINAGRIE	Ministry of Agriculture and Livestock
MoU	Memorandum of Understanding
NAIP	National Agricultural Investment Plan
NAPA	National Action Plan for Adaptation to Climate Change
NAS	National Agricultural Strategy
NDC	Nationally Determined Contribution
NGO	Nongovernmental Organization
NLC	National Land Commission
NPSC	National Project Steering Committee
NPV	Net Present Value
NRM	Natural Resource Management
OBPE	Burundi Office for Environmental Protection
PA	Protected Area
PADZOC	Sustainable Coffee Landscape Project (*Projet d'Aménagement Durable des Zones Caféicoles*)
PCU	Project Coordination Unit
PDO	Project Development Objective
PEFA	Public Expenditure and Financial Accountability Review
PF	Process Framework
PFM	Public Financial Management
PIM	Project Implementation Manual
PPCU	Provincial Project Coordination Unit
PPSD	Project Procurement Strategy for Development
PRSP	Poverty Reduction Strategy Paper
R&D	Research and Development
ROAM	Restoration Opportunities Assessment Methodology
RPF	Resettlement Policy Framework
SCD	Systematic Country Diagnostic
SLM	Sustainable Land Management
SPAT	Provincial Land Management Scheme (*Schéma Provincial d'Aménagement du Territoire*)
STEP	Systematic Tracking of Exchanges in Procurement
SW	Staff Week
TA	Technical Assistance
ToR	Terms of Reference
UNDP	United Nations Development Programme
WRI	World Resources Institute

Regional Vice President:	Makhtar Diop
Country Director:	Bella Bird
Senior Global Practice Director:	Karin Kemper
Practice Manager:	Magda Lovei
Task Team Leader(s):	Paola Agostini, Philippe Dardel and Amadou Alassane

BASIC INFORMATION

Is this a regionally tagged project?	Country(ies)	Financing Instrument
No		Investment Project Financing

[ ] Situations of Urgent Need of Assistance or Capacity Constraints

[ ] Financial Intermediaries

[ ] Series of Projects

Approval Date	Closing Date	Environmental Assessment Category
10-Apr-2018	14-Mar-2023	B - Partial Assessment

Bank/IFC Collaboration
No

Proposed Development Objective(s)

19. The Project Development Objective (PDO) is to restore land productivity in targeted degraded landscapes and, in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency

Components

Component Name	Cost (US$, millions)
Institutional Development and Capacity Building for Landscape Restoration and Resilience	2.00
Sustainable Landscape Management Practices	22.00
Improved Management of Protected Areas and Reserves	3.00
Contingency Emergency Response (CERC)	0.00
Project Management, Coordination, and Monitoring	3.00

Organizations

Borrower :	Ministry of Finance, Budget and Privatization
Implementing Agency :	Ministry of Water, Environment, Land and Urban Planning

PROJECT FINANCING DATA (US$, Millions)

[ ] Counterpart Funding	[ ] IBRD	[ ] IDA Credit	[✓] IDA Grant	[ ] Trust Funds	[ ] Parallel Financing

Total Project Cost:	Total Financing:	Financing Gap:
30.00	30.00	0.00
	Of Which Bank Financing (IBRD/IDA): 30.00	

Financing (in US$, millions)

Financing Source	Amount
IDA-D2760	30.00
Total	**30.00**

Expected Disbursements (in US$, millions)

Fiscal Year	2018	2019	2020	2021	2022	2023
Annual	0.22	2.42	4.56	8.15	8.85	5.82
Cumulative	0.22	2.63	7.19	15.34	24.18	30.00

INSTITUTIONAL DATA

Practice Area (Lead)

Environment & Natural Resources

Contributing Practice Areas

Agriculture
Social, Urban, Rural and Resilience Global Practice

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	High
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	High
7. Environment and Social	Substantial

8. Stakeholders	Substantial
9. Other	Substantial
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

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

Legal Covenants

Sections and Description

FA Schedule 2, Section I.A.2.2 - No later than twelve (12) months after the Effective Date, the Recipient shall:

(a) establish and thereafter maintain at all times during the implementation of the Project, a PCU within MEEATU with a mandate, terms of reference, resources, and composition satisfactory to the Association, including a Project coordinator, financial management specialist, procurement specialist, monitoring and evaluation specialist, technical officer, internal auditor, gender and social inclusion specialist, environmental specialist, and

accountant, in each case with qualifications, experience and terms of reference satisfactory to the Association; and

(b) thereafter take all measures necessary to cause the PCU to assume responsibility for Project coordination and implementation from the Coffee Sector Competitiveness PCU, (including, inter alia: (a) planning and budgeting for Project implementation, including the preparation of Annual Work Plans; (b) procurement and financial management for the Project; (c) technical supervision, quality control, gender and social inclusion, environmental and social safeguards performance, and monitoring and evaluation for the Project), in a manner satisfactory to the Association.

Sections and Description
FA Schedule 2, Section I.C.1 - Not later than one month, in each calendar year (or one month after the Effective Date for the first year of Project implementation), the Recipient shall prepare or cause to be prepared for the purpose of forwarding to the Association, a draft annual work plan and budget for the Project (including Training and Operating Costs) for the subsequent calendar year of Project implementation, of such scope and detail as the Association shall have reasonably requested.

Sections and Description
FA Schedule 2, Section IV.1 - Notwithstanding any provision to the contrary, Emergency Expenditures required under Part D of the Project shall be procured in accordance with the procurement methods and procedures set forth in the CERC Operations Manual.

Conditions

Type	Description
Effectiveness	FA Article IV, 4.01 (b) - The Recipient has established the Project Steering Committee in accordance with the provisions of Section I.A.1 of Schedule 2 to the Legal Agreement.
Effectiveness	FA Article IV, 4.01 (c) - The Recipient has adopted the Project Implementation Manual in accordance with Section I.B of Schedule 2 to the Legal Agreement in form and substance satisfactory to the Association.
Effectiveness	FA Article IV, 4.01 (a) - The Recipient has issued an authorization letter, in form and substance satisfactory to the Association, extending the mandate of the Coffee Sector Competitiveness PCU to include the coordination and implementation of the Project, in accordance with the provisions of Section I.A.2 of Schedule 2 to the

	Legal Agreement.
Type Disbursement	Description FA Schedule 2, Section III.2.b - Notwithstanding the provisions of Section III.E.1 of Schedule 2 of the Legal Agreement, no withdrawal shall be made under Category ([2]), unless the Association is satisfied, and so indicates by written notification to the Recipient, that all of the following conditions have been met with respect to activities under Part D of the Project: (i) the Recipient has determined that an Eligible Crisis or Emergency has occurred, has furnished to the Association a request to include said activities under Part D of the Project in order to respond to said Eligible Crisis or Emergency, and the Association has agreed with such determination, accepted said request and notified the Recipient thereof; (ii) the Recipient has prepared and disclosed in country and on the Association's website all Safeguards Instruments required for said activities, and the Recipient has implemented any actions which are required to be taken under said safeguards Instruments, all in accordance with the provisions of Section I.E.3(b) of Schedule 2 of the Legal Agreement; (iii) the Recipient's Coordinating Authority is adequately staffed and resourced as provided for under the provisions of Section I.E.2 of Schedule 2 of the Legal Agreement, for the purposes of said activities; and (iv) the Recipient has adopted an CERC Operations Manual in form, substance and manner acceptable to the Association and the provisions of the CERC Operations Manual remain or have been updated in accordance with the provisions of Section I.E.1(c) of Schedule 2 of the Legal Agreement so as to be appropriate for the inclusion and implementation of said activities under the Part D of the Project.

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Paola Agostini	Team Leader(ADM Responsible)	Global Lead	GENDR
Amadou Alassane	Team Leader	Sr Agricultural Specialist	GFA13

Philippe Eric Dardel	Team Leader	Sr Environmental Specialist	GEN01
Prosper Nindorera	Procurement Specialist(ADM Responsible)	Senior Procurement Specialist	GGOPF
Clement Tukeba Lessa Kimpuni	Procurement Specialist		GGOPF
Rahmoune Essalhi	Procurement Specialist		GGOPA
Hugues Agossou	Financial Management Specialist	Senior Financial Management Specialist	GGOAC
Alice Museri	Team Member	Team Assistant	AFMBI
Anders Jensen	Team Member	Senior Monitoring & Evaluation Specialist	GENOS
Anita Nugu	Team Member	Procurement Specialist	GGOPF
Asha Nequia Johnson	Team Member	Operations Analyst	GEN07
Claire Marion Nicolas	Team Member	Economist	GGSCE
Dora Nsuwa Cudjoe	Team Member	Sr Environmenetal Specialist	GENGE
Emelyne Calimoutou	Team Member	Legal Analyst	LEGAM
Erin Conner	Team Member	Operations Analyst	GCCFM
Esther Bea	Team Member	Program Assistant	GEN01
Hussein Jumaine	Team Member	Sr NRM Expert	GENDR
Issa Thiam	Team Member	Finance Officer	WFACS
Mei Xie	Team Member	Senior Natural Resources Management Specialist	GCCSO
Mimako Kobayashi	Team Member	Sr Natural Resources Economist	GEN01
Paul Scott Prettitore	Team Member	Sr Land Administration Specialist	GSULN
Peter F. B. A. Lafere	Social Safeguards Specialist	Sr Social Specialist	GSU01
Shri Vasantt Kumar Jogoo	Team Member	Environmental Specialist	GEN01
Tchilalou Awesso	Team Member	Voice Secondee	GENDR
Tracy Hart	Environmental Safeguards Specialist	Sr Safeguards Specialist	GEN01
Valens Mwumvaneza	Team Member	Senior Agriculture Economist	GFA13
Yu Huan	Team Member	Analyst	GCCSO

Extended Team

Name	Title	Organization	Location
Jaap VanDePol	Agronomist	FAO	
Federico Preti	Consultant, Hydrologist	University of Florence	
Florence Alberta Ferrari	FCV Specialist		
Giulio Castelli	Consultant /Hydrologist	Worldbank	
Jumaine Hussein	Sr Natural Resources Specialist	Worldbank	
Pascal Thinon	Land Specialist	World Bank	

BURUNDI
BURUNDI LANDSCAPE RESTORATION PROJECT

TABLE OF CONTENTS

I. STRATEGIC CONTEXT

A. Country Context

1. **Burundi's aim of reducing poverty and achieving shared prosperity in a sustainable manner is constrained by demographic burden and fragility.** Political and climatic fragility along with economic volatility are putting a break on the country's growth prospects. As identified by the 2017 Systematic Country Diagnostic (SCD), political, institutional, economic, and environmental fragility are highly intertwined and, in many ways, feed on each other.

2. **Burundi's geographic and demographic characteristics, exacerbated by climate risks, have subjected the rural lands to immense pressure.** Much of the country's terrain is hilly and mountainous, with natural forests once covering 30–50 percent of its territory. The country is endowed with other valuable natural assets such as abundant rainfall, a dense river network, freshwater lakes, fertile arable land, and productive marshlands. However, Burundi has an extremely high population density (approximately, 470 per square km), and is the second most densely populated country in Africa, with rapid population growth (3.3 percent per year over the past two decades). With slow urbanization, 87 percent of the population still resides in rural areas, mainly engaging in small-scale agriculture. The consequence has been a substantial pressure on forests and agricultural lands. As forests have been cleared for agricultural production, they now account for only 6.6 percent of the country's territory. Steep hillsides have increasingly been brought under cultivation without erosion control and, with significant land fragmentation into tiny plots, intensive farming practices have increasingly become unsustainable because of declining soil fertility and land degradation. Amplified by climate events such as torrential rains, flash floods, and droughts, the frequency and intensity of landslides in the hilly farmed areas have increased. This is affecting top soils and cultivable land, thereby, increasing the pressure to convert remaining forests to agricultural lands.

3. **In addition, Burundi has a history of extreme climate-related events, but its capacity to respond to related shocks remains very low.** It is the fourth most vulnerable country and the 20th least ready country in the World when it comes to combating climate change effects and coping with natural disasters such as droughts, wildfires, floods, and land-slides. Historical data show that Burundi has experienced alternating cycles of excess and deficit rainfall nearly every decade over the last six decades, as well as overall increased mean temperature, with the dry season getting longer. Past extreme weather events including the severe floods in 2006 and 2007 and severe droughts in 1999–2000 and in 2005 (Republic of Burundi, 2007), accounted for losses exceeding 5 percent of gross domestic product (GDP) (2017 SCD) affecting over 2 million Burundians.

4. **In that context, the consequences of deforestation and land degradation have been costly to the population and the economy.** Indeed, the population depends significantly on the land resource: not only is it the source of food, income, and energy for the vast majority but, as poverty reaches nearly 77 percent of the population (living with less than US$1.90 per day), it is also particularly vulnerable to related incidents such as floods and dry spells. Deforestation and intensive agriculture on hillsides without proper erosion control (for example, terracing) have disturbed soil integrity and compromised the water retention function of the soil upstream. Thus, landslides and floods are more frequent, causing substantial damages to the infrastructure and human lives downstream. This was illustrated by the tragic 2014 floods

in Bujumbura despite rainfall within norms. Compounding the effects of soil erosion, intensive agriculture without adequate use of fertilizer has also affected crop yields. Thus, production has stagnated over the last two decades and is lagging below population growth[1] and has threatened rural households' food and nutrition security and livelihoods (stunting affects a remarkable 60 percent of the children under 5 in rural areas). Soil erosion has also led to the shrinking of water bodies, such as Lake Tanganyika and the northern lakes, and siltation and drying up of various rivers, including those feeding hydroelectric dams. The Burundi Country Environmental Analysis (CEA) has estimated that the annual cost of yield losses of major crops (beans, maize, and sweet potato) because of soil erosion amount up to US$209 million, while that of flood risk due to unsustainable land management is about US$3.3 million. In addition, pressure on the land resource, further stressed in some instances by the return of displaced populations, has directly contributed to social tensions and related instability.

5. **Despite long-term trends, past approaches to the problem have often been reactive. As shown under other recent interventions, a proactive approach would be necessary to address the root causes upstream.** Reactive policies have included repair of roads and bridges after landslides and floods, dredging of streams and rivers, and technical and material support to farmers after failed crops. However, without addressing the root causes of weak water retention of soils or erosion of fertile soils upstream, these reactive measures will need to be simply repeated with increased frequency and magnitude.

6. **With climate change, the frequency and intensity of severe meteorological and hydrological events are likely to continue escalating, amplifying the risks of further soil erosion and crop yield reduction.** The proposed project therefore aims at reversing the policy approach by promoting proactive investment in building a resilient landscape with sustainable land management (SLM) practices.

B. Sectoral and Institutional Context

7. **Many interrelated problems are observed in rural landscapes in Burundi.** Rapid population growth has been a major contributing factor of deforestation through land use change for farming and because of household dependence on wood for fuel. In turn, as access to off-farm biomass has decreased, households have turned, for their energy needs, to on-farm organic material that normally contributes to soil fertility. Burning of wood fuel itself causes indoor air pollution in rural households with serious health consequences. Furthermore, as there are now few, if any, opportunities for land expansion (agricultural land already covers 79 percent of the territory), fragmentation of cropland because of population growth drives farmers to further intensify production, hence depleting soil fertility to the limit and, along with it, crop productivity. There is inadequate production to meet many households' year-round food needs. Undernutrition is further exacerbated by seasonal hunger, typically around October and April, the time during which there is typically insufficient intake of micronutrient rich foods.[2] As the population depends heavily on natural resources for their livelihoods, the issues described above further aggravate rural poverty and fuel tensions (exacerbated by disputes over the land resource). In turn, they push the poor to use unsustainable cropping and animal husbandry practices and further exploit off-farm resources (high deforestation rates and informal mining activities). There are significant environmental consequences,

[1] Net agricultural production per capita has decreased by over 20 percent in the last two decades (Food and Agriculture Organization [of the United Nations] [FAO]).
[2] Hence, only 19 percent of children 6–23 months consume a diverse diet (at least four food groups), only 33 percent are fed with World Health Organization-recommended frequency, and only 29 percent consume iron-rich foods (World Food Program 2012, Food Security Monitoring system).

including soil erosion and encroachment in protected areas (PAs). About 80 percent of Burundi's land is agricultural, with almost all being rain-fed and vulnerable to climate variability and change. Decreasing rains in the northeastern region increases risks to lives, crops, livestock, and increases chance of bushfires.

8. **Accordingly, the landscape restoration effort in Burundi must address multifaceted problems related to rural poverty, nutrition, and food security, as well as land use at the community level.** Deforested and degraded land must be actively repaired by replenishing lost soil nutrients and planting appropriate vegetation cover to restore hydrological functions of the soil systems. Measures to prevent future upstream soil erosion and downstream catastrophes also need to be introduced. This includes terracing of sloped farmlands and use of living plant materials for erosion control ('bioengineering') in critical locations. These activities will increase crop yields and bring back into production some of the farmlands that have been deserted after depletion of soil nutrients or because of physical inaccessibility (for example, landslides). This would relieve severe shortage of arable land and help address conflicts related to access to farm lands. To increase efficiency of its agrarian economy, Burundi also needs to improve weather forecasting and climate services to help farmers better manage water and agriculture-related infrastructure, inform climate smart planning approaches, and enhance agricultural productivity. Wider adoption of improved agricultural practices also contributes to improving land productivity and reducing soil erosion. Finally, measures to prevent further deforestation must also be taken. Active protection of the remaining forest, particularly in PAs and their surrounding areas, is essential. In addition, efforts to curb the demand for fuelwood by households may be useful (for example, promotion of improved cookstoves and rural electrification). International experiences (for example, in Ethiopia and Rwanda) show that the success of these efforts requires strong engagement of local communities and administrations, as well as active participation of landowners with legally recognized access and ownership.

9. **In pursuit of landscape restoration in Burundi, special attention needs to be given to land institutions as well as fragility.** The main issues around rural land resources in Burundi have been well documented: (a) majority of the population depends on exploitation of the land resources for their livelihood, (b) plots are rapidly and continuously fragmented (an average of 0.5 ha per household, down to 0.3 ha in some areas such as near Bujumbura), (c) disputes over land are the most common cause of litigation before courts and other resolutions and sometimes escalate into physical violence, and (d) the overwhelming majority of landowners do not possess any legally recognized document proving their rights. In the context of the proposed project, all these points are relevant. The relevant unit of landscape restoration is a hill (or *colline* in French),[3] which sometimes corresponds to the lowest administrative unit in Burundi. This means that restoration activities will span across boundaries of individual land plots, and collaboration and cooperation across landowners are essential for the success of restoration at the landscape level. Establishing clear and transparent demarcation of each plot is a necessary step. By addressing this issue, the proposed project will also support the other interventions in contributing to reducing land resource-related social tensions in the targeted communities.

C. Higher-Level Objectives to which the Project Contributes

10. The project contributes to Vision Burundi 2025, which serves to guide national policies and strategies, including on sustainable management of natural resources, and the related Poverty Reduction

[3] That is, the spatial unit around which land uses are logically organized by communities, from the top to the bottom of the hill.

Strategy Paper II (2012). Under the latter, it will directly contribute to promoting development through sustainable environmental and spatial management under Pillar 4 (Protection of the environment and sustainable resource management), as well as increasing productivity in agriculture and expanding access to better-quality economic infrastructure under Pillar 2 (Transforming Burundi's economy to generate sustainable and job-creating growth). In addition, the project responds to findings in the 2017 Burundi CEA, with 'deforestation and degradation of rural lands' identified as one of 'three major areas of environmental challenges in Burundi'. Although not its core purpose, the project will also contribute, in the targeted areas, to Burundi's land reform as reviewed under the new 2011 Land Code. The latter aims at relieving land titling constraints and promoting an alternative mechanism for decentralized land administration and land certificates' issuance.

11. The project also responds to Burundi's commitments as the current chair of the Commission of Central African Forests, which brings Burundi to the core on issues of forest and landscape restoration; and the country's pledge to restore 2 million ha of degraded forest landscapes by 2020 under the Bonn Challenge (2011) and the Africa Forest Landscape Restoration (AFR 100) Initiative (2015). The project will directly contribute to the country's achievement of some of the United Nations' Sustainable Development Goals, particularly Goal 1: no poverty; Goal 2: zero hunger; Goal 3: good health and well-being; Goal 6: clean water and sanitation; Goal 13: combat climate change and its impacts; and Goal 15: protect, restore, and promote sustainable use of terrestrial ecosystems. Finally, the project aligns with the country's National Adaptation Programme of Action and will contribute to some of the priority efforts of adaptation to the adverse effects of climate change and, by doing so, will allow Burundi to advance toward its Nationally Determined Contributions (NDCs) for a low-carbon, climate-resilient future.[4]

12. Finally, by promoting both increased and diversified production under smallholder farming, the project will "strengthen households' access to, and consumption of highly nutritious foods" and by disseminating selected micronutrient-rich crop varieties, contribute to 'food fortification' and reducing critical Vitamin A and iron deficiencies. These form priorities for addressing mother and child undernutrition in Burundi under the 2014–2017 Multisector Food Security and Nutrition Strategic Plan (*PSMSAN* in French).

Relevance and Relationship with the World Bank Portfolio and Initiatives

13. The project is consistent with the World Bank's twin goals of eliminating extreme poverty and boosting shared prosperity. It will contribute to addressing extreme poverty in Burundi, by improving land-based production of the rural poor, while increasing their resilience to climate and disaster risks as well as mitigating land resource-related conflicts. Also, as it will work at the community level and involve all its members, it will contribute, under the shared prosperity goal, to mitigating rural inequalities, which have recently increased (2015 Burundi Vulnerability Assessment, World Bank).

14. The project will also contribute to implementing the 2015 Africa Climate Business Plan, 2016 Climate Change Action Plan, and the Forest Action Plan set for FY16–20. The first outlines the World Bank's plans to increase climate resilience and promote low-carbon development in Sub-Saharan Africa, by 'creating climate-resilient landscapes', 'promoting climate-smart agriculture', and 'strengthening the hydromet

[4] By 2030, the target contribution in terms of reduction in emissions is 1,958 Gg CO_2e for the unconditional objective and 14,897 Gg CO_2e for the conditional objective.

program', to which the project will contribute. The second specifies directions to scale up climate action and integrate climate change across the World Bank's operations. The last aims at boosting the potential of forests to lift people out of poverty and generate lasting social, economic, and environmental returns.

15. The project also aligns with Burundi's 2017 SCD, which highlights the dependence of the economy on agricultural land productivity and the implications of land degradation and climate change on domestic growth, livelihoods, and overall development.

16. The proposed operation will build on other related World Bank Group analytical work in the country, especially those involving natural resource management (NRM), conservation, and promotion of the agriculture sector, including the findings and recommendations in the Poverty Assessment and the CEA. Hence, as the former recognizes that 'soil erosion worsens Burundi's socioeconomic situation, and particularly affects the poorest', and that 'investing on land restoration is greatly needed, as infrastructure or agricultural projects relying on fragile lands cannot fully succeed'.

17. The project will also complement existing operations: the Lake Victoria Environmental Management Project (LVEMP II-P103298), which aimed to improve the health of the Lake Victoria basin; the Agro-Pastoral Productivity and Markets Development Project (P161447), which promotes increased productivity and commercialization of rice, coffee, milk, and banana; the Sustainable Coffee Landscape Project (*Projet d'Aménagement Durable des Zones Caféicoles*, PADZOC - P127258), which promotes green technologies for sustainable coffee production; the Coffee Sector Competitiveness Project (P151869), which aims to increase the productivity and quality of Burundi coffee; the Burundi Maternal and Child Nutrition Enhancement Project, which is implemented by the nongovernmental organization (NGO) Bioversity International and aims at increasing the production and consumption of micronutrient-rich foods in Gihofi and Makamba; and the Program for Integrated Agriculture Growth in the Great Lakes, which aims to increase production and marketing of selected agriculture commodities of local communities in the Rusizi plain and near Lake Tanganyika. The proposed project will also draw from studies and lessons learned by the World Bank Social Safety Net Public Work Program and NGOs operating in the country to inform its community participation in local labor-intensive work mechanism.

18. The project will also coordinate efforts with multiple donors and NGOs working in the country, including FAO, International Fund for Agricultural Development (IFAD), United Nations Development Programme (UNDP), Global Environmental Facility (GEF), German Agency for International Cooperation, Swiss Cooperation, Bioversity International, and the NGOs ZOA-International and NGO International, among others. It will implement the approaches that the country has developed and validated through implementation along with their support. Finally, project implementation will contribute to inform and promote the Government's broader national landscape restoration program currently under early preparation.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

19. The Project Development Objective (PDO) is to restore land productivity in targeted degraded landscapes and, in the event of an Eligible Crisis or Emergency, to provide immediate and effective response to said Eligible Crisis or Emergency.

20. The PDO is expected to be achieved through support for the following components (a) institutional development and capacity building for landscape restoration and resilience, (b) sustainable landscape management practices, (c) improved management of PAs and reserves, (d) a Contingency Emergency Response (CERC), and (e) project management, coordination, and monitoring.

21. The two priority regions and related provinces are (a) northwest region, Bujumbura Rural Province and (b) east region, Muyinga Province. In the same regions and considering the scale of these issues in Burundi, four other provinces have been prioritized for possible support, if confirmed, at a later stage.[5] Therefore, the project could be the first of similar projects.[6] The priority areas were selected based on the following criteria: (a) most degraded land and high levels of soil erosion; (b) higher incidence of poverty; (c) greatest risk of floods and landslides; (d) greatest potential to protect downstream infrastructure (roads, houses, power, water supplies, and so on); (e) proximity to PAs; (f) coverage by other ongoing projects; and (g) visibility for demonstration purposes (proximity to major highway).

22. The project results chain is built around the following core sustainability requirements: (a) social sustainability—the PDO will only be achieved if conflicts between and within communities in the targeted areas are prevented, especially around productive resources such as land and water; (b) economic sustainability—the PDO will only be achieved if beneficiaries increase income gains and reduce food gaps; and (c) environmental sustainability—the PDO will only be achieved if the natural resources capital is managed sustainably and its services maintained, especially production-related services. The project is expected to move Burundi away from the trajectory of land degradation, destruction, malnutrition, poverty, and flooding to a virtuous cycle of sustainable landscape management, increased jobs, increased resilience, increased agriculture productivity, improved land tenure, as well as reduced displacements and conflicts.

B. Project Beneficiaries

23. The primary project beneficiaries are the smallholder farmers living in the Bujumbura Rural and Muyinga Provinces. It is expected that at least 80,820 small producer households[7] will directly benefit from project interventions (of which, 51 percent are women). They are (a) poor farmers with an average of 0.5 ha land who cultivate mainly food crops to supplement their livelihoods and (b) vulnerable groups in the targeted area, communities in and around the targeted PAs, particularly youth, Batwa, internally displaced populations, and other segments of the population at risk of natural and climate-induced disasters and potential violent mobilization. The project will support and mobilize community-based NRM groups and farmers' groups and provide related smallholder farmers with training, technical, investment support, and inputs (for example, climate-resilient planting stock and livestock as source of manure) to enable uptake of innovative land restoration/management technologies at scale. This support will entail land certification, terracing, and related structures (bioengineering) when required by the terrain, including through labor-intensive public works. The project will also promote the development of alternative livelihoods (for example, ecotourism). As a result, and overall, smallholders will have access to expanded, more secured, and improved land resource and will be less exposed to disaster-related risks.

[5] These are Bubanza, Kayanza, Cankuzo, and Ruyigi Provinces.
[6] Subject to confirmation by the relevant parties at the appropriate time.
[7] Of which, 24,360 are in the 22 *collines* (Component 2) and 56,460 households reside in and around the main PAs (Component 3).

Improved farm production will contribute to related households' enhanced nutrition status, food security, and livelihoods, in a more peaceful environment.

24. Other direct beneficiaries will include national, provincial, and *colline*-level institutions, as well as services providers (both public and private). At the national level, the project will strengthen and help sustain cross-sectoral collaboration between the Ministry of Water, Environment, Land, and Urban Planning (MEEATU); the Ministry of Agriculture and Livestock (MINAGRIE); the National Land Commission (NLC); and other key public agencies and research institutions involved in forest and agricultural support services (the Institute of Agronomic Sciences of Burundi, *Institut des Sciences Agronomiques du Burundi* [ISABU], the Institute of Geography of Burundi, *Institut Geographique du Burundi* [IGEBU], the University of Burundi, and so on). It will support implementation of the Government's policies, laws, regulations, and strategies on erosion control, land productivity improvement, and land ownership. At the provincial, commune, and *colline* levels, relevant Government offices will be provided with equipment and other logistics needed to provide robust support for community mobilization and monitoring of project interventions, including on land certification. Service providers will include the different organizations, for example, NGOs and public works firms, that will provide services or inputs under the project, or coordinate/implement specific project activities.

25. The total number of direct beneficiaries is expected to reach about 614,700 people, including those who will benefit from improved soil productivity and erosion control measures in the project area. This will include 300 staff from Government and partner agencies who will receive training.

26. In addition, the populations living downstream of the treated areas, including in urban areas, will indirectly benefit from more resilient infrastructure and improved control over floods. In addition, improved local hydromet early warning services will indirectly benefit populations in broader geographical areas beyond the project-targeted regions.

Addressing the Gender Gap

27. A gender gap analysis was carried out during preparation. Major gaps were identified related to access of women to paid jobs, land rights, and extension services. The proposed project will address these three gender gaps by facilitating women's access to community labor-intensive activities financed by the project; supporting land rights by facilitating land certification for women and joint certification of husband and wife; facilitating women's participation in formal and informal decision-making structures, platform, and governance processes related to ecosystem-based adaptation that will allow their voices to be heard and obtain equitable access to project benefits; and designing special extension services activities for women, including women specific Farmer Field Schools (FFS). The results framework is keeping track of these measures to address gender gaps with three intermediate indicators specific for women related to labor intensive works; technology adaption; and land certification (see also annexes 6 and 11).

Climate Co-benefits

28. **Carbon sequestration.** The project is expected to contribute to increased carbon sequestration through reforestation, rehabilitating degraded land, and improved agricultural practices. Using the tool called Ex-Ante Carbon-Balance Tool (EX-ACT), it is estimated that the project contributes to a carbon sink

of 4,522,814 ton CO_2e.[8] In addition, the project will contribute to significant adaptation co-benefits through soil erosion control activities and improved seeds, including drought resistant varieties to help farmers adapt to the drought caused by climate change.

C. PDO-Level Results Indicators

(a) Land productivity in targeted degraded landscapes (index)

(b) Land area under sustainable landscape management practices (ha)

(c) Share of targeted community members with rating 'Satisfied' or above on project interventions (disaggregated by sex) (%)

III. PROJECT DESCRIPTION

A. Project Components

29. The project will use a community-led landscape approach—that is, an integrated approach to sustainably manage land and water resources for multiple purposes and functions. Managing natural resources in an integrated way across different land uses and connecting them at the landscape level (*colline*, watershed) provides the basis for addressing trade-offs and enhancing people's livelihoods, security, and resilience to climate variability and change. To successfully implement this approach, the project will support policy development and capacity building in support of planning and implementing a landscape approach across economic sectors by focusing on development challenges at the right scale and by minimizing trade-offs and reaping more value from existing resources. The project will be implemented through five components.

Component 1: Institutional Development and Capacity Building for Landscape Restoration and Resilience (US$2 million)

30. The project will support the development of policies and capacities at the national and local levels to plan and implement land preservation and restoration in the targeted project areas, using a resilient and integrated landscape approach. This will be done by financing technical assistance (TA), workshops, operational costs, and equipment.

31. **Watershed planning and policy support** activities will entail the development and dissemination of a manual on participatory watershed management and erosion control, as well as the establishment of effective interdepartmental structures to organize collaboration on water management at the watershed level. Activities will also support the uptake of the landscape restoration opportunity assessment methodology as well as the improvement of hydro-meteorological related early warning services locally

[8] The carbon sequestration is mainly from reforestation of 3,000 ha on denuded land and establishment of 6,000 ha of woodlots (−2,315,763 tCO_2e), rehabilitating of degraded cropland through progressive terraces of 28,000 ha, and radical terraces of 400 ha (−1,405,149 tCO_2e), and improved agricultural practices (−858,221 tCO_2e). The livestock component (42,893 tCO_2e) and application of lime and fertilizer on radical terraces (13,426 tCO_2e) will emit some greenhouse gases, which brings the project's total carbon balance to −4,522,814 tCO_2e (negative means carbon sequestration).

(for example, on flood risks) for the communities and relevant local institutions in the targeted watersheds/basins. In addition, these activities will support strategic planning and policy reforms for landscape restoration. This will include the review and updating of existing policies and regulations to address identified gaps, and guidelines for implementing relevant pieces of regulations. The outputs will focus on: integrated approaches for forest, watersheds, and agriculture land-use management; community mobilization and partnerships for sustainable forest landscape restoration (FLR), including PAs; landscape restoration/land-use planning at the *colline* levels; inclusion, as an innovative development, of women as co-beneficiaries of the national land certification scheme; and targeted studies, for example, on the effect of land development on land tenure and resource mobilization for sustainable Protected Area (PA) management.

32. **Capacity development activities** at both the national and local levels will support tailored capacity development (skills training and knowledge exchange) for the various public agencies, administrations, and partners that contribute at the different levels (from the *colline*/local to the national level) to executing and implementing activities. The project will promote local communities' role in project decision making and to overall peace building at the local level. For example, the project will facilitate the inclusion of all actors, including women, in the selection committees in a structured community mobilization and beneficiary selection process that hinges on (a) equitable distribution across the unit target area; (b) vulnerable groups (for example, ex-combatants, youth, elderly, Batwa people); and (c) improved grievance redress and conflict mitigation (adopting community recognized vehicles). The activities will also support improved local monitoring and evaluation (M&E) involving communities. In addition, support will be provided to the Land Commission Permanent Secretariat, to archive, at the central level, land certification information generated at the local level under Component 2. Finally, the project will facilitate improved collaboration between the key Government ministries and other donor partners by supporting national platforms for the FLR and sustainable land and water management.

Component 2: Sustainable Landscape Management Practices (US$22 million)

33. The project will restore degraded landscapes and improve land management in the targeted *collines* of the Bujumbura Rural and Muyinga Provinces, in the communes of Buhinyuza and Isale. This will be done through land certification, landscape restoration and erosion control, and improved practices of crop production. The targeted total area is about 13,000 ha for 22 *collines*. Activities will be designed so that lessons can be drawn and approaches improved for possible scaling up of similar work into other communes under a follow-up phase/project. The project will finance TA, works, goods, and operational costs.

Subcomponent 2.1: Landscape Restoration and Erosion Control (US$16.6 million)

34. Under the first subcomponent, the project will construct over 7,800 ha of terraces on degraded hillsides and strategically augment vegetation[9] cover at critical points in the landscape to prevent soil erosion, increase soil moisture, and reduce surface runoff. This will entail a range of supporting activities such as biophysical treatment of gullies, tree planting, agroforestry, 'green manure' crops, fodder grass contour hedges, water harvesting, and selective soil fertility enhancements. Taking a community-driven

[9] Including 846 ha of bioengineering works, 1,693 ha in soil conservation, 2,539 ha in water harvesting civil works, 1,693 ha of reforestation in non-PAs; and, by extension under Component 3, 120,777 ha in the PA system.

approach, the service providers (civil works firm or NGOs) will mobilize community/local labor for labor-intensive activities to build the terraces and plant vegetation. Activities will draw, from similar experiences in Burundi, Rwanda, and Ethiopia, and technical guidelines for terracing will be developed before starting implementation (see annexes 8 to 10). The outcome is expected to strengthen resilience to climate change risks, reduce river sedimentation and flood risks, and enable recovery of agricultural lands.

Subcomponent 2.2: Improved Crop Production Practices and Nutrition (US$3.6 million)

35. Activities under this subcomponent will support farmer groups to protect the topsoil, recover their soil fertility, and intensify crop production through SLM practices, including year-round production of micronutrient-rich foods. This will entail farmers' training and experience sharing, access to improved inputs (seeds and seedlings, including high nutritional varieties, tree crops, soil stabilizing grasses, and fodder crops) including by establishing community nurseries, and access to livestock as a critical source of manure (using the well-established 'solidarity chain' mechanism). Training will include nutrition messages and demonstration plots based on the integrated agriculture-nutrition approach developed under the Burundi Maternal and Child Nutrition Enhancement Project, while the introduction of bio-fortified crops, for example, beans and bananas, will aim at addressing iron and vitamin A deficiencies, respectively.

Subcomponent 2.3: Land Certification (US$1.8 million)

36. Activities under this subcomponent will start before the first subcomponent to establish clear plot boundaries before starting the terraces. Among other outcomes, this will address risks related to disputes on land rights once it is treated.[10] A new law and institutional framework exists and allows the procedures for land certification. In line with the new Land Code of 2011, using the approach and systems that have proved robust and effective under recent land certification projects in the country, the project will provide assistance in setting up and strengthening decentralized land certification offices and supporting systematic certification of the land on all the *collines* of the communes of Isale and Buhinyuza. The process will follow an established series of rigorous steps, which promote inclusiveness and accessibility of the process through intense consultation and participation, community verification of the results, an appeal mechanism, dispute mediation and resolution, and data archiving at the central level. To address an important gender gap (gender inequity in land tenure), a study will be undertaken in the early phase to specify project implementation activities in the project areas, including the initial awareness and consultation process. As women are currently not recognized in land titles, the project will also encourage joint signature of husband and wife on land certificates.

Component 3: Improved Management of Protected Areas and Reserves (US$3 million)

37. Activities will support the effective and sustainable development of the PA system in Burundi to preserve the biodiversity (for example, chimpanzees) and ecosystem services for the well-being of people with focus on the forest-dependent Batwa and PA communities. Representing 5.9 percent of the land mass, the PAs harbor biodiversity of national and global importance and protect major river systems. The proposed activities will scale up successful outcomes and address major gaps in the implementation of the management plans for three priority PAs of Burundi: the Kibira National Park, the Ruvubu National

[10] Structural works like terracing can then start as soon as it is assessed that any dispute potentially identified has been addressed through early mediation, or does not form an obstacle for moving forward while it is being addressed.

Park, and the Bururi Forest Reserve. In these areas, the project will promote ecological, economic, social, and institutional sustainability of the PA system. In particular, it will support activities focusing on the communities, through communication, education, and information on biodiversity, community-led conservation, and PA restoration including in monitoring and surveillance. To reduce the destructive use of natural resources, it will promote income-generating activities such as honey production and tree fruits with positive economic prospects (for example, passion fruit), and the development of ecotourism business plans. The project will provide the needed training, skills improvement, and infrastructural capacity for park management; support community's role in decision making around PA management; and strengthen partnerships and collaboration with key line ministries and local PA conservation organizations and groups.

38. The activities will first deal with the sustainable management of PAs through (a) the provision of technology, equipment, and resources to strengthen surveillance involving communities and local law enforcement, as well as PA boundary demarcation; (b) development, revision, and implementation of PA management plans to improve biodiversity conservation; and (c) public awareness and education on biodiversity and wildlife. Activities will also promote jobs and alternative livelihoods around PAs, community-led conservation, integration of Batwa communities into PA management activities, as well as community-based ecotourism in and around PAs. The latter will entail the construction and rehabilitation of park infrastructure, wildlife rescue, tourist services training and skills, marketing and promotion of tourism services in the PAs, strengthening local partnerships, and improving PA connectivity.

39. The project will benefit (a) PA communities in and around the PAs in jobs and training; (b) NGOs, local PA conservation groups, or associations through capacity building and joint partnerships for service delivery, and communities who indirectly depend on PA services, including for water, soil protection, medicinal plants, and aesthetic/cultural values; (c) the Batwa communities through support for their full integration in planning, decision making, and implementation of PA protection activities and in the choice and provision of viable alternative livelihoods for them; (d) the Office for Environmental Protection (OBPE) in skills development and infrastructure; (e) the public sector by strengthening its capacity to manage and regulate ecosystem services in PA landscapes; and (f) the global community in the preservation of biodiversity of global importance, as well as carbon mitigation.

Component 4: Contingency Emergency Response (CERC) (standardized, US$0 million)

40. This contingency component can be triggered by a joint Government and World Bank agreement in case of an emergency. This component had been embedded in the project to finance early recovery and/or specific emergency works, goods, and services, in case of eligible emergencies/crises/disasters caused by natural hazards in the project area. The mechanism is designed to support enhancement of preparedness, early recovery activities, and provision of a rapid response to disasters that can be implemented in a relatively short period. This component was considered necessary because of Burundi's vulnerability to, for instance, unexpected flooding or erosion. Reallocation of funds to the CERC can only be done when there is a serious disruption of the functioning of a community or society causing widespread human, economic, or environmental losses that exceed the ability of the affected community or society to cope using its own resources. Following such a disaster event where both the region and national resources cannot sufficiently and adequately address the situation, the Government of Burundi (GoB) may trigger activation of the CERC according to national law and subject to the World Bank's activation policy.

Component 5: Project Management, Coordination, and Monitoring (US$3 million)

41. This component focuses on all aspects of project management, including procurement, financial management (FM), M&E, knowledge generation and management, communication, monitoring of mitigation measures related to environmental and social safeguards, and preparation of annual work plans and organization of audit reports. This will include a communication strategy to report on the project results and raise awareness about land degradation, restoration, and climate change issues. The M&E system will report on the expected project's results and systematize the project's lessons learned. Finally, the project will also finance studies to assess the project's impacts on specific elements such as revenues to beneficiary communities and improved livelihoods; and effectiveness of resource mobilization for the sustainable management of PAs. To manage these functions, the project will establish a new Project Coordination Unit (PCU) and finance TA, works, goods, workshops, and operational costs.

B. Project Cost and Financing

42. The estimated cost of the project is US$30 million from IDA.

Table 1. Project Cost and Financing

Project Components	Project Cost (US$, millions)	IDA Financing
Institutional Development and Capacity Building for Landscape Restoration and Resilience	2.0	2.0
Sustainable Landscape Management Practices	22.00	22.00
Improved Management of Protected Areas and Reserves	3.00	3.00
Contingency Emergency Response	0.00	0.00
Project Management, Coordination, and Monitoring	3.00	3.00
Total Costs	30.00	30.00
Total Project Costs		
Front End Fees		
Total Financing Required	**30.00**	**30.00**

C. Lessons Learned and Reflected in the Project Design

43. Historically, land management investment trends show an evolution from single sector interventions to embracing broader ecosystem-based integrated and resilient landscape approaches.[11] The project design draws on lessons from the World Bank's experience spanning over four decades in landscape-based interventions in the East Africa sub-region and across the globe. In addition, SLM/landscape-specific operations such as the Sahel and West Africa Program in support of the Great

[11] As referenced in the Integrated Landscape Management for Enhancing Resilience in Africa's Drylands, as part of the World Bank study on 'Confronting Drought in Africa's Drylands'.

Green Wall Initiative in 12 countries, and the Strategic Investment Program for SLM in 26 African countries, provide a catalogue of lessons learned and best practices, including trends and policy options to develop sound landscape projects, mainly:[12] (a) strategic long-term engagement with continued Government leadership; (b) mobilize and build on bottom-up initiatives that incentivize local communities' roles in decision making; (c) pilot new innovative approaches, test, and apply new technologies and tools to unleash multifaceted solutions at scale; (d) support policies and incentives to create the enabling environment for sustainable NRM with focus on land rights; and (e) adopt multipronged and multisector approaches that address the complex challenges facing degraded landscape.

44. Taking account of these lessons as well as specific ones from Burundi's, Ethiopia's and Rwanda's land terracing SLM investments, the Burundi Landscape Restoration Resilience Project (BLRRP) design adopts a community-led participatory approach for restoring agricultural and forest lands at a landscape level hinged on land rights; combines a mix of technologies (bioengineering, water harvesting, terracing, crop intensification, PA forest restoration, local livelihoods promotion that take pressure off forests) toward a mix of solutions (land productivity, jobs, improved ecosystem services, such as cycling of water, biomass, and nutrients); adopts bottom-up approaches such as Farmer Field School, over top-down approaches; involves all major stakeholders in a decentralized decision-making mechanism that will involve local communities—including women, youth, and Batwa—in decisions around their resources; and embeds the project in the Government's long-term development and provision to strengthen policies and capacity.

45. The design of the land certification subcomponent recognizes that "when they own, then they care"[13] and draws lessons from similar interventions in Burundi and Ethiopia, which demonstrate that systematic land certification registration of land parcels contributes to reducing land disputes and supports social peace, sustainable development, and improved agricultural and rural productivity in project areas. The design also incorporates key elements of land governance best practices: (a) a land certification procedure that is anchored in an instituted law and policy framework; (b) a decentralized process involving commune-level certification offices and land rights recognition commissions at the *colline* level, that reinforces community participation and access to enhance local ownership, transparency, verification of the results, and ability to appeal where needed; (c) ability to connect parcels to a national coordinate reference system to ensure sustainability; and (d) incentive mechanism for continuous registration of land transaction and subdivision of parcels, after the first-time certification.

46. The project also draws from extensive experience across Sub-Saharan African countries which shows that land titling programs have increased soil conservation investments, productive on-farm investments, as well as yields and profits for farmers (Deininger and Byerlee 2011). In Burundi, land titling need to be implemented with careful consideration for the local political fragility. The project factors this into the design and therefore adopts a land titling mechanism that has been tested and secures local communities' involvement upfront and throughout the cycle.

[12] See World Bank, 2017, *Fighting Land Degradation at Landscape Scale*.
[13] Paraphrased from the chair at the 2017 land certification/land degradation conference held at the World Bank, Washington, DC.

47. The project also considers the fragility context. In line with the recommendations from the Country Learning Review for the Country Assistance Strategy cycle FY13–16, the project has conducted a Fragility Assessment and used the findings in setting realistic, achievable results that reflect conflict sensitivity, fragility, and political context. The project will use NGOs and other local, national, and international service providers for effective delivery in this regard.

48. The project promotes public-private collaboration and partnerships through ecotourism business plans involving PA communities, Batwa, and partnerships between local communities and PA conservation groups. This builds on the experience of the Bururi Forest Reserve support operation under the PADZOC.

49. Additional lessons recommend the adoption of tailored approaches for communication and dissemination of results and knowledge products using local language and culturally appropriate styles. The project will promote communication tools tailored to the categories of beneficiaries for sharing lessons and disseminating information.

50. The project also builds on experience under nutrition interventions, both worldwide and in Burundi.[14] Considering the scale of malnutrition and its multiple and interrelated determinants, multipronged interventions are required, while agriculture and food security-related interventions should systematically mainstream targeted nutrition actions. Evidence shows that homestead gardens and biofortified crops can improve household nutrition when combined with nutrition education, which is what the project will indeed promote.

IV. IMPLEMENTATION

A. Project Institutional and Implementation Arrangements

51. The implementation arrangements contribute to the overall efforts of Burundi to reduce risks and increase resilience by supporting those Burundians who need help the most. To do that, the project will adopt an inclusive and participatory process for community involvement in decision making and in implementation of project activities.[15] The project will build conflict-prevention and trust-building implementation arrangements at the local and national levels; involve independent NGOs in the implementation of the components; and include private sector, farmers organizations and NGOs along with the Government's agencies in the Steering Committee of the project.

52. Institutionally, the project will use existing structures, committees, and units at the provincial and commune-levels and provide resources/inputs to reinforce their capacity to support project implementation. Where such basic institutions are not existent as may be the case in some target areas, the project will support the GoB in establishing them.

53. The Project Coordination Unit (PCU), with two regional offices, will be hosted by the MEEATU, that is, the executing agency**.** The PCU will manage the day-to-day operations of the project. It will have the

[14] See, for example, The Lancet Mother and Child Nutrition Series of 2008 and 2013; and The World Bank. 2017. Burundi Maternal and Child Nutrition Enhancement Project, Project Paper.
[15] As recommended by the 2017 Risk and Resilience Assessment (RRA - World Bank, Draft).

key task of ensuring technical coordination and interaction of the different services and organizations responsible for implementing the respective project subcomponents and activities at both the central and provincial/local levels, as well as between these levels. Execution of the project components and subcomponent activities will be contracted by the PCU to local, national, and international service providers. Service providers will be selected using a transparent and inclusive process taking into due account demonstrable experience and institutional capacity in the targeted area of concern. Service providers will include local civil works contractors and national and international NGOs. Labor will be supplied by the local workforce to be hired from the project area with focus on vulnerable groups, women, youth, and the Batwa people (community labor-intensive works program). To ensure proper oversight, a mixed public-private Project Steering Committee will be established at the national level, and this will be mirrored by some multi-stakeholders' technical task force at the provincial level. These arrangements are detailed further in this section.

Project Implementation Responsibilities

54. The PCU will have the overall responsibility for managing the project. This will be a new unit and comprise Government staff and consultants with expertise in fiduciary domains, relevant technical domains, M&E, safeguards, gender, communication, community mobilization, and administration. It will be responsible for managing the Designated Account (DA), recruiting service providers, ensuring monitoring and supervision, and reporting on the project performance to the National Project Steering Committee (NPSC) and the World Bank. The Safeguards Specialists will be in charge of project safeguards awareness and accountability. Established at the central level, the PCU will have decentralized teams at the provincial level—the Provincial Project Coordination Units (PPCUs). These will ensure the link between the central management and local actors. Staffed with three or four technical/executive officers per unit, they will contribute to implementation of the PCU's responsibilities locally, including project supervision and monitoring.

55. **Transitional arrangements for project implementation.** As a transitional arrangement for implementing the proposed project and ensuring rapid startup, the PCU for the ongoing Coffee Sector Competitiveness Project will have initial responsibility for coordination and implementation. During this transition period, the recipient will establish the new dedicated PCU for the proposed project. The new PCU will take responsibility for project coordination and implementation from the Coffee Sector Competitiveness PCU within 12 months after the project effectiveness date.

56. Mobilization of grassroots-level groups will form a central feature of project implementation. To facilitate peer learning at the grassroots level, existing groups constituted around natural resources and forest landscape management (for example, watershed management groups and FFS groups) will be strengthened or created, if and as needed. These groups will form the unit for local training, awareness, and community-led monitoring of project performance.

57. For prefeasibility studies, design, and field-level implementation of activities, the project will contract different specialized service providers (for example, consulting and civil works firms, NGOs, and technical institutions), most of which are engaged in NRM activities in the targeted landscape.

58. Hence, under Component 1, the PCU will contract consultancy firms with specialized expertise (for example, in forest and natural resources policies) to address the related analytical and capacity-building

gaps. In particular, the International Union for Conservation of Nature (IUCN) will conduct the national-level Restoration Opportunity Assessment Methodology (ROAM) exercise and train the National ROAM Group. Key technical aspects of the local early warning services will be supported through consultancies while ensuring the integration of systems and services. Twinning or other partnership arrangements for the IGEBU with appropriate international, regional, or national meteorological and hydrological agencies will also be considered. Procurement of equipment will be carried out in line with the World Bank procurement guidelines (see Section on Procurement in Annex 2).

59. Under Component 2, service providers will be recruited on a competitive basis to support implementation of the landscape restoration and erosion control activities, that is, manage community awareness and sensitization, community mobilization for the FFSs, and organization of local labor for civil works.

60. Local environment and civil works engineering firms will establish the terraces, as well as the bioengineering and water-harvesting infrastructure. The community mobilization NGOs and the environment and civil works engineering firms will implement labor-intensive related activities using local people.

61. For improved crop production practices and nutrition activities, the FAO will be engaged to support FFS activities and other selected training activities (including nutrition-agriculture integration). Similarly, Bioversity International will support activities related to the provision of agricultural seeds for planting in the restored land, in collaboration with the national agricultural research and development (R&D) agency ISABU.[16] Seeds and other farm inputs will be distributed with FAO's support through the FFS groups. The FAO and Bioversity International will actively mobilize the relevant national/local services and stakeholders and collaborate with them to promote capacity building and institutional sustainability.

62. To implement the land certification activities, a service provider with demonstrated experience in implementing models similar to those proposed under the project will be recruited to support the Communal Land Services (*Service Foncier Commercial*, CLSs) and the Local Reconnaissance Land Commissions (LRLC). Support will also be provided by the Association for Peace and Human Rights (*Association pour la Paix et les Droits de l'Homme*, APDH) and, for capacity building and guidance including archiving of land certificate information, the Permanent Secretariat of the NLC. The project implementation arrangement will support the overall peace-building efforts and integrate locally recognized grievance redress approaches adopted for land certification and overall NRM. Hence, CLSs will support implementation of the Grievance Redress Mechanism (GRM) and conflict redress for land certification. The CLSs are newly established *colline*-level commissions that provide local communities access to relatively low-cost land management services. They have the primary responsibility for implementing land certification. An LRLC (local reconnaissance land commission) will be established at the level of each *colline*. Members include local administration officials and *colline* delegates who are chosen by the community. The LRLC (local reconnaissance land commission) examines the situation of each plots decides on the merits of the property before land certificates are issued, and helps resolve any land ownership disputes at the *colline*-level amicably.

[16] ISABU's mandate includes provision of certified seeds, extension services, and applied research activities, soil analysis, and promotion of agricultural best practices in agricultural intensification.

63. Under Component 3 on PAs, the OBPE will supply the tree inputs and technical support for restoration interventions in and around the target PAs. The respective park management teams will manage the program of activities as developed in the respective management plans' following the model successfully implemented for managing the Bururi Forest Reserve under the PADZOC. The project will provide them and existing Community Patrol Groups with basic equipment. It will also mobilize NGOs and specialized institutions to implement relevant activities such as livelihood diversification promotion for the local communities.

Project Oversight Responsibilities

64. The NPSC, chaired by the MEEATU along with the MINAGRIE as Vice Chair, will provide policy, strategic, and technical guidance, review implementation progress, advise on and approve the project's annual work plan and budget, and ensure coordination between the different stakeholders in the targeted landscapes. Meeting at least twice a year, it will comprise relevant officials/representatives from key sector ministries and institutions, the governors of the provinces where the project intervenes, as well as selected farmers' organizations, NGOs, and the private sector.

65. A Technical Committee will meet depending on the needs, to promote effective interaction between the different implementation entities and provide them with technical guidance.

66. Decentralized technical task forces will be set up at the provincial level with similar responsibilities, locally, as the NPSC, including in terms of promoting effective interaction and coordination between the different implementing entities at the local level. Chaired by the Provincial Governor, they will involve the respective PPCUs, commune administrators involved in the project, local implementation partners, a local university or research institution, and the private sector.

B. Results Monitoring and Evaluation

67. The M&E system will provide the data needed for assessing the project's performance and guide the timely adoption of corrective measures. The M&E framework of the project will be described in the Project Implementation Manual (PIM) and will be based on the following: (a) the project intervention logic; (b) alignment with other relevant M&E frameworks at the country level; and (c) compliance with the World Bank Group requirements, including the selection of key core indicators and specific indicators for gender and civic engagement (see details in annex 2).

68. The project outcomes and impacts will be evaluated through both the PDO- and intermediate-level indicators described in the results framework.

69. The monitoring of project outputs will be conducted in partnership with the various implementing partners. The PCU will be responsible for data consolidation, quality control, and analysis and reporting. The annual monitoring reports will be used by the PCU when preparing the annual work plan and budget and by the supervision missions, to ensure that the project is on track. The province/commune-level PPCUs will also oversee communicating the monitored information to the MEEATU, which will feed the national and provincial M&E system.

C. Sustainability

70. The sustainability of the project is predicated on the following major considerations: (a) highly participatory consultation process and demand-driven approach; (b) a strong capacity-building program, including strengthening of local watershed groups; (c) soil erosion control, crop intensification, and increased farmer land productivity; and (d) preventing potential land disputes.

71. All farmer groups will benefit from capacity-building programs in key skill areas. The project will strengthen farmer knowledge and ownership of terraced parcels, and with provisions for continued production on the farm plots, project benefits can be sustained. Promoting a farmer-driven approach, the FFS will ensure that new and innovative knowledge in landscape planning and management, as well as nutrition, can be disseminated with multiplier effect through a training-of-trainers module. Land certification will further reduce local conflicts and spur integrated landscape interventions at the watershed level. In the long run, the sustainability of production outcomes will also gain from improved nutrition status and related improved household labor and savings.

72. Sustainability of the BLRRP will therefore be found in the long-term financial and non-financial benefits that will be achieved because of project activities in targeted landscapes:

(a) Improvements in the enabling environment (such as institutional, technical, and implementation capacity, and the regulatory framework for sustainable management of forests) will be sustained beyond the project's life span.

(b) The TA elements of this operation will support the definition of tools and methodologies that can then be scaled up in the context of the landscape approach.

(c) Participatory land-use planning mainstreaming environmental and climate change considerations will be a tool for short-, medium-, and long-term decision making regarding all involved sectors.

(d) Secure land certification will incentivize farmer/landowner interest in investing in medium- to long-term productivity of their land parcels.

(e) Land tenure security will contribute to unblocking existing barriers for long-term investments in the land.

(f) Improvement of PA management and expansion of the PA network will ensure long-term provision of the ecosystem services (generating local, national, and global environmental benefits) that come from such areas.

(g) The ownership, implementation, and mainstreaming of the program across Government institutions will make sustainable resource management practices an integral part of national land-use planning and development efforts. The current support from the highest level of Government to climate change and biodiversity investments is key to the program's sustainability.

(h) Involvement of the private sector will contribute to the sustainability of such investments that are mutually beneficial to the private sector actors and the local communities.

(i) Financial incentives in the form of livelihood benefits, hiring of local people for labor-intensive works, and access to natural resources will further sustain local community engagement during and beyond the project.

D. Role of Partners

73. The project will be assisting local communities within the Bujumbura Rural and Muyinga Provinces to reduce pressure on the forests through improved land-use planning, increased land productivity, and erosion control measures. Toward this end, it will rely on several strategic development partners active in Burundi to scale up agricultural innovation. Some of the key ones are the NGOs and the private sector. There are many and large development-oriented agencies that can also be engaged to improve delivery at the local level, including the following:

- Bioversity International will support activities related to the provision of improved seed resistance to climate change and with improved nutritional value to be planted in the restored land.
- The FAO will support the establishment of the FFSs. The project will seek opportunity to engage the FAO's expertise to improve land productivity and promote agriculture-nutrition integration.
- The University of Burundi will support the training for establishing terracing, bioresource engineering measures, and water-harvesting technology.

V. KEY RISKS

74. **The overall risk rating for the proposed project is Substantial.** The key factors underlying this rating are related to the issues highlighted in the following paragraphs. They take guidance from the 2017 Burundi Risk and Resilience Assessment (World Bank, draft).

75. **Political and governance risks are rated High.** Intermittent violence in the capital city and the potential for the situation to spiral further out of control are making it difficult to implement effective development interventions. The international community is pressing for political negotiations to end or at least appease the cycle of violent political crisis and reduce the likelihood that civil conflict will resume. The World Bank will closely monitor the situation with the United Nations and bilateral and international development partners. Considering the fragile context, the World Bank will also promote transparent and inclusive dialogue with independent civil society organizations and producers to prevent the capture of resources by private interests and to support local mechanisms to attenuate any tensions that could arise around the project.

76. **Macroeconomic risks are rated Substantial.** Since 2006, the Government has managed to stabilize the economy, with growth in real GDP and GDP per capita averaging 4.1 percent and 1.1 percent per year,

respectively. Recent political instability has slowed economic activity. The macroeconomic situation has deteriorated and public debt has risen, just as international development aid has declined substantially. These factors may impede sectoral reforms and slow implementation of the project. The project will monitor and adapt to the situations to the extent feasible. Also, the approach and activities that the project will implement, e.g. community level activities including labor intensive works, are less susceptible to macro-economic instability than interventions that have strong links to the banking and business sectors.

77. **Institutional capacity for implementation and sustainability risks are rated Substantial.** Burundi is a post-conflict country with inadequate technical and institutional capacity at all levels. The MEEATU and the MINAGRIE have limited administrative and fiduciary capacity. Also, the project will involve different sectors and mobilize a number of organizations, at both the central and local levels, hence calling for an appropriate and community-led conservation coordination set up. To mitigate this risk, project implementation will provide capacity development to address gaps, rely on an adequately staffed and equipped PCU, promote local community engagement, engage technical partners and NGOs with demonstrated capacity to support implementation of different project components, and implement methodologies and approaches that have already demonstrated their effectiveness in Burundi (for example, land certification under the Swiss Cooperation supported project).

78. **Fiduciary risks are rated High.** Financial and procurement management risks are related to the large number of transactions, the inherent country fiduciary risk, community labor-intensive activities which account for over 50 percent of the total cost, and significant number of beneficiaries and agreements with technical agencies. An additional risk includes the Government preference for a new PCU to be established instead of using an existing one. Transparency of the PCU staff recruitment will follow a rigorous process to avoid experiencing delays for effectiveness. To manage these risks, the recruitment process will be closely monitored to ensure the new PCU is staffed with competent and experienced staff. In addition, as a transitional arrangement until the new unit is established, the existing PCU of the Coffee Sector Competitiveness Project will support the Government in mitigating critical fiduciary risks. The project will not deal directly with the beneficiaries of community labor-intensive work and community-based organizations (CBOs), but will have limited number of contracts with limited service providers (the NGOs, Bioversity International, FAO, and so on). Detailed FM assessment risk has been provided in annex 2.

79. **Environment and social risks including land disputes are rated Substantial.** This rating is based on the political and social tensions in the region, possible exacerbation of land disputes in agriculture projects, and any potential land tenure issues involving the indigenous Batwa.

80. The project will develop a GRM to resolve potential conflicts arising over land ownership and certification including the return of absent/refugee owners, community labor hiring related grievances, health-and-safety complaints, and other complaints or social conflicts that are associated with the project. The GRM will be based on existing forms of conflict resolution within the community as much as feasible and will take into account the participatory nature of the activities, the vulnerability and specific needs of the beneficiaries. The design of the GRM will be based on a social analysis of the communities in which it is implemented, consulted with communities and included in the project manual. In addition, the project will hire an NGO to build the capacity of agencies to implement the GRM and to monitor and report on its implementation in the targeted communities. Also, communication activities under Component 5 will emphasize the fact that the project supports those Burundians who need help the most,

as well as the different tools set forth to generate trust and transparency, and address related concerns (for example, support to decision making at the community level and grievance mechanism).

81. Hence, the project will address land dispute risks through the certification process: in particular, the process will be characterized by comprehensive use of information, communication, awareness, community participation, mediation of identified disputes, and an appeal mechanism, including for conflict-related displaced people and refugees.

82. With regard to environment, the main risk is associated with inadequate capacity to monitor the implementation of mitigation measures, contained in either the ESMF or ESMPs. The project will require the recruitment of experienced Environmental as well as Social Safeguards' Specialists to ensure proper monitoring and implementation of safeguards measures. Another risk is the potential conflict that may arise between agricultural development and need for conservation. The project proposes to promote effective land-use planning and management systems to reduce the possibilities of such conflicts.

83. **Other risks include climate change risks, which are rated Substantial.** In nearly every decade for the past 60 years, Burundi has experienced alternating cycles of flooding and drought, as well as an overall increase in mean temperatures and the length of the dry season. Burundi was severely affected by the last 2015–2016 El Niño cycle (heavy rainfall and related landslides and floods, followed by drought spells). While Burundi is highly exposed to climate shocks, it has extremely low capacity to respond to them. To mitigate the risks imposed by climate change, the proposed project will promote the adoption of drought-resistant varieties and improved water management. It will also prioritize relevant investments and financing for climate-focused initiatives.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

84. **Approach.** The economic analysis for this project has focused on the activities of Component 2, where the most direct project impacts on the economy, environment, and population are expected. The other three components are expected to support the success of the project, thus indirectly contributing to the project benefits. Because not all project sites for Component 2 have been identified, quantitative analysis was not easy to conduct for the entire project. Hence, the quantitative analysis focused on the two communes where the first phase of activities will be implemented and the results obtained for these two communes were extrapolated to the rest of the project.

85. **Summary of analysis.** The overall economic analysis of the BLRRP shows strong economic profitability. From the economic analysis, the average net present value (NPV) is US$5.48 million (using a 20 percent discount rate and 20-year benefit stream) and the average economic rate of return (ERR) is 26 percent. The lion's share of benefits comes from on-site private benefits within the project area (for example, direct income increase, avoidance of yield, or income loss that would occur without the project, and flood risk reduction).

86. **The project's development impact is Substantial.** The Burundi CEA has identified deforestation and land degradation as a major environmental problem, costing the country on average US$123 million each

year. Effects of natural disasters (costing US$23 million each year) and biodiversity loss may be considered as secondary problems caused by deforestation and land degradation. The CEA calls for immediate action for physical restoration where the effects of environmental damages are acute and threaten lives and livelihoods of the population, noting that to prevent further damages and to reverse the trend, the root causes of the problems must also be addressed simultaneously.

87. The proposed project aims at supporting the country with this effort. With 90 percent of the population residing in rural areas, the majority of the country's population crucially relies on rural agricultural lands for food and livelihoods. While productive farming land continues to become scarce because of population growth and land degradation, the project activities are expected to increase the acreage of cultivable lands and their productivity in target communities. In addition, in target communities near PAs or national parks, where the last remaining forests are at great threat of further degradation, residents will be supported with alternative livelihood opportunities to reduce the pressure on and safeguard the valuable natural capital while addressing poverty of the population that are heavily dependent on those natural resources.

88. **Public sector provision and financing is the appropriate vehicle.** It is generally the case that the type of investment proposed in this project clearly requires financing by the public sector. With the externalities associated with environmental problems and natural disasters, large-scale private funding for erosion control or environmental protection is not practically expected. However, the proposed project aims at contributing to the provision of initial investment for conditions for sustainable growth in the future. With investments in land certification processes, improved land productivity, and resilient ecosystems, private investments in agriculture value chains and associated industries are expected to be encouraged in the long run.

89. **The World Bank will provide value added** as it is in a unique position for providing the needed support to countries like Burundi. Indeed, it has coordinated forest and landscape programs across the world, in many cases linking up with relevant multiple sectors, implemented multilateral/bilateral donor funding, and leveraged additional technical and financial resources to meet emerging needs. The World Bank has also established partnerships with the client country in areas such as transportation, energy, disaster management, agriculture, and public health. Direct and indirect synergies flowing from such collaboration are expected to contribute to the success of the proposed project.

B. Technical

90. **Identification of landscape restoration opportunities.** Designing interventions first focused on identifying 'drivers' of land degradation and then designing of appropriate measures to address them. The main drivers in Burundi were identified as follows: (a) deforestation (for firewood and charcoal—as wood and biomass products provide almost all domestic energy) and (b) unsustainable agricultural practices, which expand into steep slopes and soil erosion.

91. These drivers were also results of high population density, extreme poverty, low agricultural productivity, and disruption by political instability. The landscape ROAM, developed by IUCN and World Resources Institute (WRI), was applied as the main instrument in identifying the level of land degradation and priority areas for interventions. Multicriteria analysis (MCA) was used to describe degradation, reflecting both physical degradation and poverty vulnerability. The assessment identified priority

communes—considering ecosystem connectivity as well as accessibility to roads for demonstrative purposes. Poverty data were also used.

92. Specific analysis was also undertaken on technical restoration options at the *colline* level, both in terms of the menu of structural technologies, in particular, terracing and water harvesting, that the project will promote and adjust to the local context (see annexes 8 to 10) and the related approach (for example, options for mobilizing community labor) based on similar activities in both Burundi and Rwanda.

93. Similarly, specific assessment of the land certification activities was undertaken, building on recent developments and experiences in the country (see annex 11).

C. Financial Management

94. Different reviews, including a Public Expenditure and Financial Accountability (PEFA) review and use of the Country System for Investment Projects, highlight the weak public financial management (PFM) system in Burundi. For this project, the country's PFM system will not be fully used and a dedicated PCU will be established. Moreover, until the dedicated PCU is established, the Coffee Sector Competitiveness PCU will perform day-to-day FM activities for the project.

95. The FM assessment was carried out in accordance with the World Bank Directive: Financial Management Manual for World Bank Investment Project Financing Operations, issued February 4, 2015, and effective from March 1, 2010, and the Bank Guidance Financial Management in World Bank Investment Project Financing Operations, issued and effective February 24, 2015. Key risks include the absence of a PCU to coordinate the project's activities. In addition, the project will manage a large number of transactions; the inherent country fiduciary risk is high; cash for community labor-intensive activities, risky by nature, accounts for over 50 percent of the total cost; and there will be a significant number of beneficiaries and agreements with technical agencies during the project implementation. Additional risk includes the Government preference for a new PCU to be established instead of using an existing one. The PCU staff recruitment will follow a rigorous process to ensure full transparency. The conclusion of the assessment is that **the FM risk is assessed as High**. The risk will be mitigated through many measures including the use of the Coffee Sector Competitiveness PCU until the new PCU is established, the recruitment of qualified and experienced fiduciary staff, the development of the PIM, and a computerized accounting system. Once the risk mitigation measures are implemented, the residual risk rating should be Substantial. A more detailed FM risk assessment and risk mitigation measures have been provided in annex 2.

D. Procurement

96. **Applicable procurement rules and procedures.** Procurement will be carried out in accordance with the Procurement Regulations for Investment Project Financing (IPF) Borrowers, namely 'Procurement in Investment Project Financing (IPF): Goods, Works, Non-Consulting and Consulting Services', dated July 1, 2016; Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (revised as of July 1, 2016,); and provisions stipulated in the Financing Agreement.

97. The overall responsibility for the management of the procurement aspects will be handled by the PCU for Coffee Sector Competitiveness Project until a new PCU is established. The procurement assessment for the new PCU will be conducted and updated during project implementation. It is also noted that the procurement staff from the current PCU have limited experience in applying World Bank Group procurement procedures. Therefore, there is still a need to strengthen procurement capacity of the implementing unit to mitigate procurement risk.

E. Social (including Safeguards)

98. The project is rated an Environmental Category B-partial assessment project with moderate environmental and social impacts that are site-specific and reversible. Social impacts have been assessed and mitigation measures identified as part of the development, consultation, and disclosure of an Environmental and Social Management Framework (ESMF) in accordance with OP 4.01 (Environmental Assessment). OP 4.12 (Involuntary Resettlement) and OP 4.10 (Indigenous Peoples) are triggered for this project.

99. **OP 4.12 (Involuntary Resettlement).** The activities under Component 1 aim at reinforcing capacity for strategic planning and policy reforms for landscape restoration, and Component 3, Improved Management of Protected Areas and Reserves, will include either the development of further restrictions to use of natural resources in Ruvubu National Park, Kibira National Park, Bururi Forest Reserve, and the other PAs in Burundi or the provision of support to enforce existing restrictions in accordance with existing park management plans. Current unauthorized uses include harvesting of wood, clay, and natural stones; slash and burn for pasture and banana plantations; and poaching of large mammals. A Process Framework (PF) has been developed for all three national parks to establish a process by which the communities participate in the design, implementation, and monitoring of forest protection activities. The PF has been developed based on the PF developed under the GEF-funded PADZOC in the Bururi National Park and the work undertaken by the GoB and development partners in the development of the park management plans in all three parks.

100. The activities under Subcomponent 2.2, Improved Crop Production Practices and Nutrition, will mostly be on private lands, on a voluntary basis, and consist primarily of the construction of 8,500 ha of progressive terraces for which negative impacts would be limited to temporary loss of livelihoods, crops, and tree crops. The hiring of community labor for labor-intensive activities in the construction of these terraces will offset the temporary loss of livelihoods and include replacement trees. In addition, the construction of 1,700 ha of radical terracing and some construction of physical infrastructure for drainage and gully erosion may lead to limited temporary and permanent involuntary resettlement, even though voluntary land donation, often in conjunction with access to agricultural intensification activities, and assistance for cash crop development will remain an option for minor land requirements (less than 10 percent of plot size). Therefore, a Resettlement Policy Framework (RPF) has been developed, consulted on, and disclosed in Burundi and at the Bank on Jan 29, 2018. The RPF includes an estimate of how much land might need to be expropriated or put under easement.

101. **OP 4.10 (Indigenous Peoples)** has been triggered as Batwa communities live in the project area and are particularly vulnerable when it comes to land rights and tenure across Burundi. Traditional Batwa forester communities in the northwest have a collective attachment to Kibira National Park and Batwa potter communities use Ruvubu National Park clay resources. An Indigenous Peoples Plan has been

developed, consulted on, and disclosed in accordance with the policy to ensure that Batwa communities participate in and are consulted on the design of the project, potential negative impacts on these communities are mitigated, and they benefit from the project. Special focus will be given to ensure their inclusion in the land certification component and their participation in forest protection.

102. The Process Framework and the Indigenous People Plan were developed on the basis of consultations with various stakeholders (public actors from different target provinces, local authorities of the pilot communes, UNIPROBA managers and Batwa communities, including the ones living around the three protected areas) and relevant documents on this subject. Focus groups and field visits were organized in the pilot *collines* of the communes Isare and Buhinyuza and around the targeted protected areas. They were disclosed in Burundi and at the Bank on Jan 29, 2018.

103. **Social and gender inclusion.** Taking a comprehensive and all-inclusive landscape approach, the project will ensure the social inclusion of different socioeconomic communities within the landscape. It will ensure that income generation opportunities for the population under each land type are compatible and maximized. Participation of youth, women, Batwa, disabled people, and aged people in the community labor-related activities and the FFSs will be encouraged and monitored. Land tenure and land transfer practices vary among communities, and the land certification component will pilot many approaches to increase social and gender equity in land tenure in the project areas, based on a study that will be undertaken in the early phase of the project. Their participation in project activities, including in those that have traditionally attracted more men, such as participation in the FFSs, forest conservation patrols, and local associations, will be encouraged and monitored under this project.

104. Women are key stakeholders in the agricultural economy and will be separately consulted to ensure that the design of the project reflects their needs and priorities. Over 92 percent of women have agriculture as their main occupation, compared to 75 percent of men, and less than 4 percent have a wage job in the nonfarm sector. Even within agriculture, women are overrepresented in the less desirable occupations: two-thirds of women have their main job in unpaid family farming, compared to 9 percent of men. Women are less likely than men to be independent farmers (to be the 'boss' of a family farm). In addition, women are often primarily responsible for meeting the water, food, and energy needs of households and communities. Thus, women and children tend to be more vulnerable to the effects of lack of food or water and to succumb in greater proportion to natural hazards.

105. The project's interventions aim to enhance equitable access, especially as a way of diversifying livelihoods in a climate-resilient manner. Some of the gender-focused activities will include gender assessments, facilitating women's participation in formal and informal decision-making structures and governance processes related to ecosystem-based adaptation, equitable provision of inputs for restoration, and trainings for capacity strengthening to ensure effective participation in restoration activities to be implemented through the local labor-intensive activities (see also annex 6 on Gender Mainstreaming).

106. **Citizen engagement and beneficiary feedback.** The project explicitly seeks to support engagement of people living in targeted landscapes that derive their livelihoods from natural resources use. Engagement of target beneficiaries aligns to, and supports the project's approach to demand-side social accountability. Through consultative processes, engagement in local level planning and feedback mechanisms, the rehabilitation of degraded landscapes will be elaborated and adjusted. Feedback

mechanisms will be developed to ensure transparency, accountability and learning as well as a continuous dialogue with target beneficiaries and other stakeholders. Particular attention will be given during implementation to improve the capacity of the local and national structures to close the feedback loop and report on action taken to address concerns and issues. The specific elements of the framework for citizen engagement include: (a) support to engagement of local communities in targeted landscapes in the planning and development of planning instruments; (b) support community engagement in determining local investment priorities; (c) support to a feedback mechanism from target beneficiaries; (d) support to build the capacity at local and national structures in engagement with target beneficiaries to address concerns and issues raised; (e) specific monitoring of project activities by a third-party organization will be supported three times during project implementation (in the first year, at mid-term and at completion) to ensure transparency and feedback on these activities. It includes a sample-based perception survey administered by a third party and an engagement forum with the target beneficiaries. Through focused discussions on the results of the perception survey, a feedback loop will be created. The protocol and mechanisms for elements of this citizen engagement framework will be detailed in the Project Implementation Manual. Quality of its implementation and progress will be monitored both at regional and national levels through supervision and dialogue.

Table 3. Citizen Engagement Framework

Contribution to PDO: to restore land productivity in targeted degraded landscapes and, in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency	Relevant citizen engagement activities	Citizen engagement results and approach to management

PDO is supported by citizen engagement as: (1) an integrative tool for demand-side social accountability in coastal resilience and planned relocation, revision of MSIPs and building capacity of local and national government institutions (2) as a means to provide a voice and engage with target beneficiaries to ensure that local, national and regional planning and investments respond to local problems, demands and needs.	A. Feedback mechanism across landscapes (third-party monitoring) and closing of the feedback loop through fora for engagement (focus group discussions) B. Capacity building of local and national government structures in citizen engagement and delivery of interventions to take account of concerns and issues	PDO Indicator: Share of targeted community members with rating 'Satisfied' or above on project interventions (disaggregated by sex) (%) Data source: field-based perception survey based on a sample by a third party

F. Environment (including Safeguards)

107. The expected benefits of the project, which include better soil fertility, increased agricultural productivity and food and nutrition security, greater availability and quality of water resources, reduced desertification, enhanced biodiversity, creation of green jobs, economic growth, mitigation, and increased resilience to climate change will greatly outweigh the negative impacts likely to be generated. The likely negative impacts resulting from project activities will be limited to possible air and water pollution, changes in the physiochemical properties of soil, loss of vegetation due to terracing, and the possible use of agricultural inputs. The core project intervention, which will support both progressive and radical terraces, will involve recognized effective land management technology for its multiple benefits, including erosion control and improved land productivity. The overall effect of such an intervention on the landscape will therefore address the main concerns identified in the CEA. Preliminary assessment of potential impacts on human population or environmentally sensitive areas, including wetlands, forests, grasslands, and other natural habitats, has shown that they will be site-specific, minimal, and reversible. The project has, therefore, been categorized as 'B'. In fact, the project will adopt an integrated landscape approach aimed at sustainably managing land and water for multiple purposes and functions. The potential impacts are readily identifiable and evaluated, and in most cases, mitigation measures can readily be designed to reduce their effects.

108. The World Bank Safeguards Policies and Procedures that are triggered are as follows: OP/BP 4.01 (Environmental Assessment) is triggered because the project involves several land restoration interventions ranging from soil erosion stabilization techniques (contour bunding, progressive/radical

terracing, and planting of anti-erosion hedges) and fodder shrubs to rainwater conservation practices. Existing infrastructure will be protected and this may require some minor civil engineering works. At this stage, while the priority provinces have been identified, the exact locations of the interventions, as well as the scope and scale of the interventions, are not known. Hence, an ESMF has been prepared, consulted upon and disclosed in Burundi and at the Bank on Jan 29, 2018. It provides the basic criteria and procedures for screening all interventions and guides the preparation of environmental and social management plan. The ESMF provides essential baseline data, confirms policies that are triggered, assesses likely impacts, proposes measures for the strengthening of institutional capacity, and estimates the budget required for the implementation of the mitigation measures. It will also include social and environmental clauses/guidelines for contractors and an environmental and social checklist.

G. Other Safeguard Policies

109. Other environmental safeguards policies that are triggered are as follows:

(a) OP/BP 4.04 (Natural Habitats) because of the presence of some essential ecosystems with rich biodiversity; in fact, one of the objectives of the project will be to enhance the quality of the ecosystems by providing improved livelihood opportunities within the perimeters of farmed areas and thereby, reducing the need to go into parks and PAs for resources, such as timber and meat;

(b) OP/BP 4.36 (Forests) in view of the fact that the country as a whole has witnessed a high rate of deforestation over the past decades, due primarily to human pressure, the project will ensure that appropriate measures are taken to protect the remaining forest cover by limiting interventions to land that is already under agricultural use and preventing any encroachment in adjacent forest areas, while protecting and restoring the patches of forests that still stand within the project areas;

(c) OP 4.09 (Pest Management) because of the likelihood that measures aimed at increasing agricultural productivity may encourage the use of pesticides. There is therefore a need to promote the use of integrated pest management (IPM) techniques, including the safe use, storage, and disposal of agrochemicals, should the need to use agrochemicals arise. The ESMF includes an IPM Plan to provide as much information as possible on ecofriendly approaches to pest management and on dissemination of composting techniques; and

(d) OP 4.11 (Physical and Cultural Resources) triggered at this stage as a ‘precautionary’ measure. Preliminary assessment has not brought to light any feature of architectural, archeological, or cultural importance (except for a cemetery in the buffer zone of the National Park of Ruvubu). However, because actual project activity sites are not known, and in view of the type of works to be carried out, the ESMF has confirmed the triggering of the said policy. The ESMF, therefore, includes a chance find procedure (compliant with national regulations and World Bank’s policy) to be followed by contractors/implementing agency on the proper management of physical cultural resources once discovered during project implementation.

H. World Bank Grievance Redress

110. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms (GRM) or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, because of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.
For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY : Burundi

Burundi Landscape Restoration and Resilience Project

Project Development Objectives

19. The Project Development Objective (PDO) is to restore land productivity in targeted degraded landscapes and, in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Land productivity in targeted degraded landscapes		Number	100.00	120.00	Biennial	Household surveys, complemented with GIS observation of Net Primary Productivity (NPP) of farm land in the respective collines, as well as surveys at farmers field school groups' level.	PCU M&E function
Description: The indicator measures (as an index) the average yield of a basket of key crops as noted by the population via household survey, and compared with surrounding collines within the same agro-ecological zone.							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Land area under sustainable landscape management practices	✓	Hectare(Ha)	0.00	89360.00	Annual	Project and activity records, and GIS backed field surveys. Technical inspection after works. Assessment of PA management interventions.	PCU M&E function
Description: The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; Adoption refers to change of practice or change in the use of a technology promoted or introduced by the project; Sustainable landscape management (SLM) practices refers to a combination of at least two technologies and approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land.							
Name: Share of targeted community members with rating 'Satisfied' or above on project interventions		Percentage	0.00	70.00	Annual	Perception Survey	PCU M&E function
Share of targeted community members with rating 'Satisfied' or above on project interventions (women)		Percentage	0.00	70.00	Annual	Perception survey.	PCU M&E function
Description: Corporately required citizen engagement and gender indicator. It reflects demand-side social accountability using a feed-back loop, and through disaggregation by sex, specifically captures the perception by women of interventions on land restoration, jobs and livelihoods							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Guidelines to support watershed management planning and landscape restoration developed and disseminated		Number	0.00	4.00	Annual	Review of the guidelines and records of endorsement and dissemination.	PCU
Description:							
Name: Collines restored according to defined criteria		Number	0.00	22.00	Annual	Project and activity records. Field inspection of public works and collines.	PCU M&E function
Description: Criteria describes the implementation and completion of a comprehensive set of restoration and sustainable land management works, including terracing, biophysical treatment of gullies, tree planting, agroforestry, 'green manure' crops, fodder grass contour hedges, water harvesting, and selective soil fertility enhancements, at the scale of each colline.							
Name: Erosion in targeted degraded landscapes		Percentage	0.00	50.00	Annual	Measured by Sediment Load Sampling	PCU M&E function

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description: SUB-WATERSHED (COLLINE) LEVEL: Monitoring with field analysis – fluvial sediment load sampling will be used to evaluate upstream terracing effect in project areas.							
Name: Beneficiaries of job-focused interventions	✓	Number	0.00	14670.00	Annual	Project and activtiy records, and Field Survey.	Firms and NGOs hiring community labor, and those working with CLSs
Beneficiaries of job-focused interventions - Female	✓	Number	0.00	7335.00	Annual	Project and activtiy records, and Field Survey.	Firms and NGOs hiring community labor, and those working with CLSs.
Description:							
Name: Farmers adopting improved agricultural technology	✓	Number	0.00	24008.00	Annual	Field survey	PCU M&E function (just farmers)
Farmers adopting improved agricultural technology - Female	✓	Number	0.00	12004.00	Annual	Field Survey	PCU M&E function (just farmers)
Farmers adopting improved agricultural	✓	Number	0.00	12004.00	Annual	Field survey	PCU M&E function

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
technology - male							(just farmers)
Description:							
Name: Land certificates issued		Number	0.00	14080.00	Annual	Review of records from Communal Land Services (CLSs) - or Services Fonciers Communaux in French.	PCU M&E function
Land certificates issued with women's name		Percentage	0.00	50.00	Annual	Project and activity records	PCU M&E function
Description: Cumulative target due to interventions under the project. All lands to be restored will be certified.							
Name: Management Effectiveness Tracking Tool (METT) for Protected Areas in targeted landscapes		Number	28.00	45.00	Biennal	METT Scoring exercise. The baseline value will be confirmed in the first year of implementation.	PCU M&E function
Description: Measures the Park Authority's ability to identify the threats to the Protected Areas and implement mitigation measures, calculated as simple average of the three protected areas.							

Target Values

Project Development Objective Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Land productivity in targeted degraded landscapes	100.00	100.00	100.00	105.00	105.00	120.00	120.00
Land area under sustainable landscape management practices	0.00	0.00	22340.00	44680.00	67020.00	89360.00	89360.00
Share of targeted community members with rating 'Satisfied' or above on project interventions	0.00	0.00	20.00	40.00	60.00	70.00	70.00
Share of targeted community members with rating 'Satisfied' or above on project interventions (women)	0.00	0.00	20.00	40.00	60.00	70.00	70.00

Intermediate Results Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Guidelines to support watershed management planning and landscape restoration developed and disseminated	0.00	0.00	1.00	2.00	3.00	4.00	4.00
Collines restored according to defined criteria	0.00	0.00	4.00	12.00	20.00	22.00	22.00

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Erosion in targeted degraded landscapes	0.00	0.00	0.00	20.00	35.00	50.00	50.00
Beneficiaries of job-focused interventions	0.00	0.00	3520.00	7040.00	10560.00	14670.00	14670.00
Beneficiaries of job-focused interventions - Female	0.00	0.00	1760.00	3520.00	5280.00	7335.00	7335.00
Farmers adopting improved agricultural technology	0.00	0.00	1501.00	6002.00	13505.00	24008.00	24008.00
Farmers adopting improved agricultural technology - Female	0.00	0.00	750.00	3001.00	676.00	12004.00	12004.00
Farmers adopting improved agricultural technology - male	0.00	0.00	750.00	3001.00	676.00	12004.00	12004.00
Land certificates issued	0.00	0.00	3520.00	7040.00	10560.00	14080.00	14080.00
Land certificates issued with women's name	0.00	0.00	50.00	50.00	50.00	50.00	50.00
Management Effectiveness Tracking Tool (METT) for Protected Areas in targeted landscapes	28.00	28.00	33.00	38.00	43.00	45.00	45.00

ANNEX 1: DETAILED PROJECT DESCRIPTION

COUNTRY: Burundi
Burundi Landscape Restoration Project

Project Approach

The Landscape Approach

1. The project uses a community-led, integrated approach for sustainably managing land, water, and forest resources for multiple purposes and functions—a landscape approach. Managing natural resources in an integrated manner across different land uses and connecting them at the landscape level provides the basis for enhancing people's livelihoods, security, and resilience to climate variability and change. This approach promotes planning across economic sectors by focusing on development challenges at the right scale by minimizing trade-offs and reaping more value from existing resources. This approach builds on the recognition of the multifaceted nature of the factors and players that have a stake in landscape-level restoration and therefore, the need for collaboration and partnership across key Government agencies—environment, natural resources and water, land administration, agriculture, and livestock—with donor development partners and NGOs (service providers) engaged in these core sectors and local communities.

Phased Approach

2. Activities of Component 2 will be implemented in two priority regions and related provinces: (a) in the northwest region, Bujumbura Rural Province and (b) in the east region, Muyinga Province. However, in the same regions, four other provinces have tentatively been prioritized for possible support, if confirmed, at a later stage.[17]

Project Site Selection

3. Project site selection followed a two step process. Firstly, several criteria were adopted for site selection of Component 2 activities to consider a range of factors. Areas of specific interest to be identified were those with (a) most degraded land and high levels of soil erosion; (b) higher incidence of poverty; (c) greatest risk of floods and landslides; (d) greatest potential to protect downstream infrastructure (roads, houses, power and water supplies, and so on); (e) proximity to PAs; (f) coverage by other ongoing projects; and (g) visibility for demonstration purposes (proximity to major highway). Based on these criteria, six provinces in the two regions were *preliminarily* identified as priority regions, which includes a total of 20 priority communes, before being further narrowed down to the two priority provinces indicated previously.

4. The preliminarily identified six provinces are the following:

(a) **Bubanza, Kayanza, and Bujumbura Rural Provinces in the northwest region.** This region was selected because of its steep terrain, fragile soil, high demographic pressure (around 400 inhabitants per km^2), and overexploitation of the land from crop and livestock farming. Even though on average the levels of poverty are not as severe as the second region, it has

[17] These are Bubanza, Kayanza, Cankuzo, and Ruyigi Provinces.

been selected because it is considered as one of the most dramatically vulnerable areas to rain-induced soil erosion. Intervention in this area is critical to stabilize and increase agricultural productivity (on the slopes as well as in the Rusizi plain) and to protect public and private infrastructure (such as roads, water and power supplies, houses, bridges, schools, and so on) from landslides caused by heavy rain. In addition, Kayanza Province is also strategic because of its proximity to the Kibira National Park and its significant levels of poverty.

(b) **Cankuzo, Ruyigi, and Muyinga Provinces in the east region.** The Burundi Poverty Assessment identifies these provinces and their corresponding communes as among the eight more impoverished provinces and most heavily environmentally degraded in the country. Interventions are crucial to improve resilience of the communities, restore key environmental services, and provide sustainable livelihood and productive opportunities that will improve living conditions. In addition, the Ruvubu National Park crosses these three provinces.

5. Subsequent site selection processes involved the use of Landscape ROAM, developed by IUCN/WRI, as the main instrument in identifying the level of land degradation and priority areas for interventions. During the project preparation phase, the project preparation team (15 members) completed the six-week ROAM online course offered by Yale University and IUCN in October–December 2016. During the course, the Task Force members (the MEEATU, OBPE, PCU, MINAGRIE) worked as a team, using three communes—Isale, Buhinyuza, and Kayanza—as real cases to collect data, stratify the land uses, and carry out ground truthing and consultation with local governments at *colline* and commune levels. An IUCN team was engaged to support the PCU and IGEBU to collect spatial data, carry out social economic survey in these communes, and compile restoration opportunity mapping. This result guided the selection of communes/*collines* and the nature of interventions.

6. Based on the results of the pilot ROAM exercise, the Isale commune (Benga, Karunga, Gishingano, Kwigere, and Nyakibande) and the Buhinyuza commune (Bunywana, Gasave, Gitaramuka, Kirehe, Kiyange, Ntobwe, Nyarunazi) have been prioritized for the project. At least 12 *collines* are expected to be treated in these communes, while the additional ones will be dealt with in neighboring communes of the same two provinces. Brief descriptions of the two communes are as follows:

(a) **Commune of Buhinyuza within Muyinga Province.** Located in the East Depression, the commune has gentle slopes, substantial deforestation, encroachment on the Ruvubu National Park, and land erosion, and it faces frequent droughts. Though less populated than the west, it has high poverty and low crop yields. There is significant potential for land restoration interventions and to ease the pressure on forest and the national park. The hydropower dam 'Gitenge' supplies electricity to both Muyinga and Cankuzo Provinces, but siltation from upstream watersheds affects the operations of the plant. Using a watershed approach, the erosion control will include both Buhinyuza and Muyinga communes.

(b) **Commune of Isale within Bujumbura Rural Province.** Located in the Congo-Nile crest in the west, the commune is highly populated with small landholding. Topography is steep and soil erosion is severe, with over 100 tons of soil loss per hectare each year. Located in the catchment of Lake Tanganyika, sediment goes to the lake and flooding affects downstream

infrastructure and the capital city. There is good potential for land restoration in the upstream watersheds, reducing disaster risk to downstream population, infrastructure, and Lake Tanganyika. The UNDP is currently supporting work on agroforestry capacity building in one to two *collines* through its grant financing. The World Bank is also funding an ongoing roads project for engineering repair (gabiens) of 14 kms. of downstream river banks. Accordingly, this project will be complementary and cover the upstream area.

7. **Burundi's provinces and relationship between environmental degradation and poverty.** From the Burundi Poverty Assessment (June 2016), the eastern and northern regions of Burundi are the most vulnerable to shocks because of the combination of high levels of deforestation and soil erosion with widespread poverty. There appears to be a link between deforestation and soil erosion and poverty headcount rates in Burundi. Most provinces in the northeast of Burundi seem to exhibit medium-to-high poverty levels combined with high tree cover loss and soil erosion. In particular, rapid deforestation and high poverty are found in the Provinces of Cankuzo, Ruyigi, and Kayanza (figure 1.1). The relationship between soil erosion and poverty follows similar geographical patterns. However, soil erosion levels are higher compared to deforestation levels: for instance, while Cankuzo has a medium level of tree cover loss combined with a high poverty rate, the same province presents a high level of soil erosion combined again with a high poverty rate (figure 1.2).

Figure 1.1. Tree Forest Loss and Poverty Headcount Rate (high, medium, and low) in Burundi

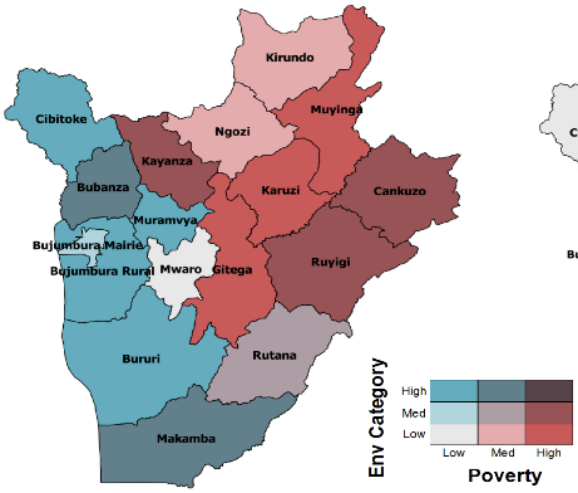
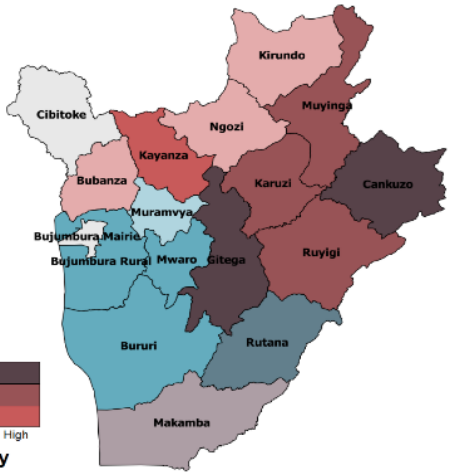


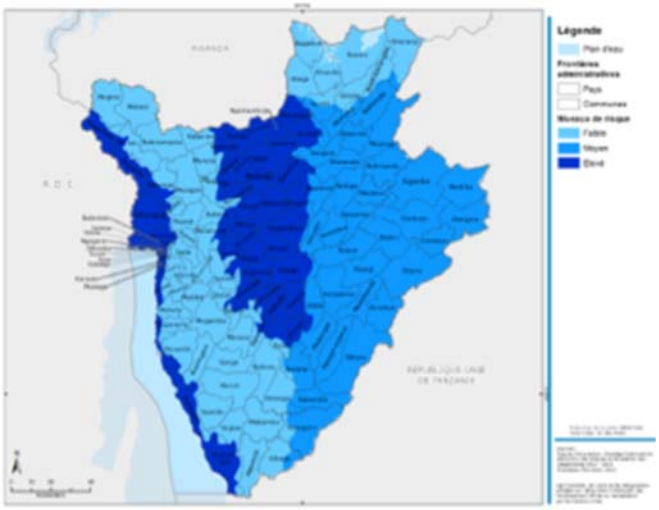
Figure 1.2. Soil Erosion and Poverty Headcount Rate (high, medium, and low) in Burundi



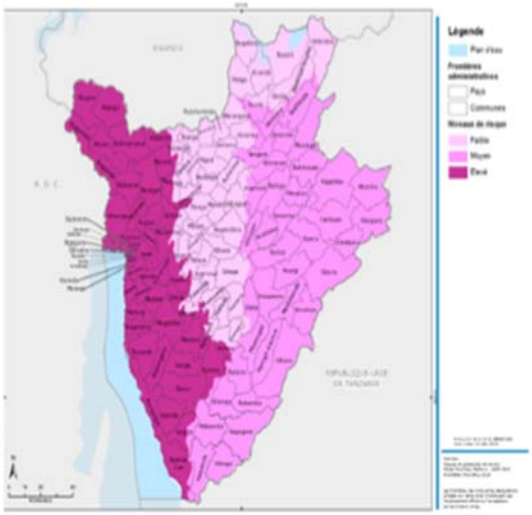
Source: Burundi CEA (2017)

Figure 1.3. Disaster Risk-Prone Areas

a. Map of Flood Risk (high, medium, and low)

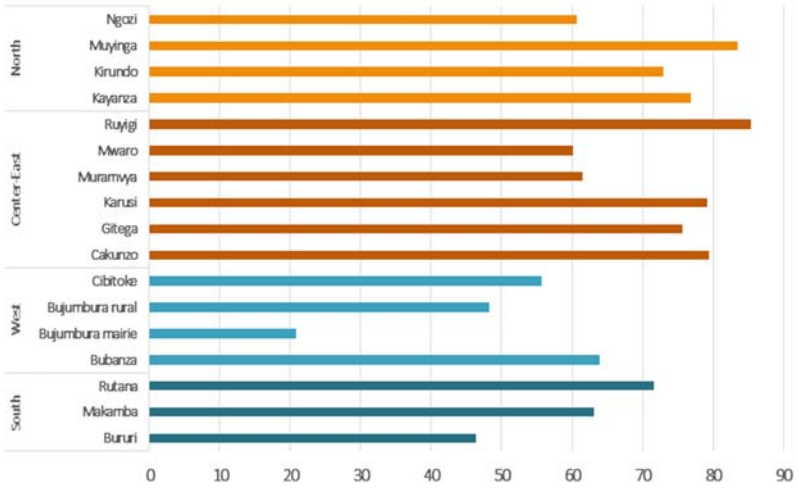


b. Map of Landslides Risks (high, medium, and low) in Burundi



Source: PAM-ICA 2015.

Figure 1.4. Poverty Incidence by Province 2013–14 (percentage)



Source: ECVMB de 2013-2014.

8. During project implementation, the PCU will continue to implement the ROAM process in the remaining short-listed communes in the two targeted project regions and based on the results of the ROAM process and experiences obtained in the first phase *collines* as well as the budget, *collines* for possible support at a later stage, will be selected.

Project Components

9. The project uses a landscape approach—an integrated approach to sustainably manage land and water resources for multiple purposes and functions. Managing natural resources in an integrated way

across different land uses and connecting them at the landscape level provide the basis for enhancing people's livelihoods, security, and resilience to climate variability and change. To successfully implement this approach, the project will support policy development and capacity building in support of planning and implementing a landscape approach across economic sectors by focusing on development challenges at the right scale and by minimizing trade-offs and reaping more value from existing resources. The proposed project will be implemented through four distinctive components, which are detailed in the following paragraphs.

Component 1: Institutional Development and Capacity Building for Landscape Restoration and Resilience (US$2 million)

10. Activities of Component 1 will support the development of the policies and capacities at the national and local levels to plan and implement a landscape approach in preserving and restoring landscape in the targeted project areas.

11. The project will finance **watershed planning and policy support** activities aimed at reinforcing capacity for strategic planning and policy reforms for landscape restoration in response to issues uncovered from a variety of exercises. Chief among them is a comprehensive review of existing policies, laws, and regulations to identify gaps in relation to integrated landscape planning and management. The project will support (a) the development of the guidelines/rules and regulations for implementing (i) forest code, (ii) water code, (iii) code for land certification, (iv) environmental code, and (v) a code for landscape management and support their dissemination; (b) the uptake of the Landscape ROAM, developed by International IUCN/WRI as a main instrument in identifying the level of land degradation and priority areas for interventions, at the NPSC; (c) mainstreaming of gender into landscape restoration activities including the national land certification scheme; (d) analysis of the links between land-use (progressive and radical terraces) and land tenure security; and (e) building on the BLRRP's experience to inform landscape restoration program development at the national level.

12. Building on the MINAGRIE National Strategy for Watershed and gleaning best practices from the sub-region, the project will finance the development of national guides on watershed management and erosion control (Participatory Landscape Restoration Manual and Erosion Treatment Manual), which will be translated into the local language and disseminated in the field.

13. Streamlined water management institutions at the watershed level are not present in Burundi such that watershed management responsibilities are shared by different actors, such as ministries, provinces, and communes. While ensuring to adopt and work with existing local institutional structures, the project will foster and finance establishment of effective interdepartmental structure(s) to support implementation and promote collaboration with the local universities and other research institutions in developing local capacity and requisite technical expertise.

14. Related activities will also support the improvement of hydro-meteorological-related early warning services (for example, on flood risks) for the communities and relevant local institutions in the targeted watersheds/basins.

15. The project will finance tailored **capacity development at both the national and local levels.** The project will promote local communities' role in project decision making and to overall peace building at

the local level. For example, the project will facilitate the inclusion of all actors, including women, in the selection committees in a structured community mobilization and beneficiary selection process that hinges on (a) equitable distribution across the unit target area; (b) vulnerable groups (for example, ex-combatants, youth, elderly, Batwa people); and (c) improved grievance redress and conflict mitigation (adopting community recognized vehicles). Activities will also support improved local monitoring and evaluation (M&E) involving communities.

16. In that perspective, capacity development interventions will target the various public agencies at the national, provincial, communal, *colline,* and local administration levels, as well as partner local implementing and executing agencies that would be involved with implementation in the field. The project will support both tertiary and short-term technical and operational training courses, goods, and equipment including improved office space, office equipment, and transportation to help reach remote local beneficiaries. The project will provide support to facilitate structured community mobilization, improved GRM, improved local M&E of project activities through the lenses of robust collaboration between the key Government ministries—the MEEATU, MINAGRIE, Land Commission, and Community Development—and donor partners.

17. In addition, support will be provided to the Land Commission Permanent Secretariat to archive and make accessible, at the central level, land certification information generated at the local level under Component 2. Indeed, as there is no functional national centralized archiving or cadaster system at this stage, and until such a system is permanently set up and running, it is important to make sure that the information generated locally by the project and maintained by the municipalities is also made accessible at a central level.

18. Finally, the project will facilitate improved collaboration between the key Government ministries and donor partners by supporting national platforms for the FLR and Sustainable Land and Water Management.

Component 2: Sustainable Landscape Management Practices (US$22 million)

19. Component 2 activities will contribute to restoring degraded landscape in the targeted project *collines*/communes of the Provinces of Bujumbura Rural and Muyinga. They will ensure that lessons learned from them will inform the design and implementation of subsequent operations. The project will first focus on the 12 priority *collines* in the two initial communes (Buhinyuza and Isale) that were identified with the use of Landscape ROAM. Once this has started, the same activities will be initiated and implemented in other *collines* of the two communes that are determined to require intervention (using the same selection criteria), then potentially another commune that has been identified during project preparation as among the priority areas for landscape restoration in the same two provinces.

20. The three subcomponents under Component 2 are as follows.

Subcomponent 2.1: Landscape Restoration and Erosion Control (US$16.6 million)

21. The landscape restoration approach in the proposed project is to construct terraces on degraded hillsides and strategically augment vegetation cover at critical points in the landscape. These activities in turn help prevent future soil erosion. Converting slope land to terraces will increase soil moisture and

reduce surface runoff, which will help build resilience to climate change risks such as increased torrential rains and droughts. It can also reduce sedimentation to the rivers and relieve some of the flood risks. Further, this will enable recovery of agricultural lands that have been abandoned and, if combined with other activities and appropriate incentives, will likely encourage farmer investment in these lands for future productivity increase.

22. This operation will support both progressive and radical terraces building on the lessons in Burundi and the positive experience from Rwanda. The project will fund the construction of radical terraces (1200 ha initially) on a small scale for demonstrative purposes, by engaging innovative farmers who are willing to explore the benefits of radical terraces on their lands. If the results are positive, more funds may be allocated for construction of radical terraces at midterm review. As the main activity of this subcomponent, the project will fund the construction of 6,600 ha progressive terraces, which will largely be carried out on private cropland and where the slope degree is between 6 percent and 25 percent.

23. Terrace construction will be combined with a range of supporting activities, including the following:

- Biophysical and soil bioengineering[18] in gully treatment to reduce soil degradation and hydraulic hazards related to river erosion
- Tree planting
- Agroforestry, which provides farmers with multiple benefits including soil fertility
- Production of cover crops as 'green manure' where compost is inadequate
- Planting of fodder crops for hedge grass stabilization along contours
- Rainwater harvesting to enhance rainwater retention in the soil (for example, the integration of infiltration ponds and trenches in stabilized hillslope to support reforestation and agricultural activities)
- Soil fertility enhancement in areas where radical or progressive terraces are built

24. To facilitate uptake of the innovative terracing design and implementation arrangements, the project will support the development of robust technical guidelines for terracing, building on existent documents for Burundi and other best practices in Rwanda and the sub-region. Taking a community-driven approach, local community members will be hired by the specialized service providers (civil works firm or community mobilization NGOs) for labor-intensive work to build the terraces and provide some income to the landowners during the construction and to the local community that have few options for regular livelihoods because of low land productivity. This subcomponent will be closely coordinated with the activities of Subcomponent 2.2, where efforts to improve agricultural production on the newly constructed terraces will be introduced. This will also be sequenced with the land certification processes

[18] Soil bioengineering is the use of living plant materials to provide engineering function, and it is an effective tool for treatment of a variety of unstable and/or eroding sites. The main advantage of the technique is low costs, compared to concrete interventions, the possibility of the organization of the works with local groups, and environmental sustainability.

to clarify and secure land rights, address any potential disputes, and avoid conflicts (see Subcomponent 2.3).

Subcomponent 2.2: Improved Crop Production Practices and Nutrition (US$3.6 million)

25. The project will support farmer groups to protect the topsoil, recover their soil fertility, and intensify crop production through SLM practices, including year-round production of micronutrient-rich foods. In building the capacity of the farmers to improve soil fertility and intensify their crop production, the project will make use of the FFS approach and through better access to improved seeds and seedlings of a large range of food crops, tree crops, soil stabilizing grasses, and fodder crops. Improved seeds include drought-resistant varieties to help farmers adapt to the drought caused by climate change. The introduction of bio-fortified crops, for example, beans and bananas, will aim at addressing iron and Vitamin A deficiencies, respectively. Selected FFS farmer groups will be trained in multiplying seeds and seedlings and to establish community nurseries. To facilitate the FFSs, the project will train the *Monitors Agriculture de Collines* as FFS facilitators and one farmer per FFS farmer group as FFS farmer facilitator. Training will include nutrition messages and demonstration plots based on the integrated agriculture-nutrition approach developed under the Burundi Maternal and Child Nutrition Enhancement Project.

26. This subcomponent will scale up the best practices and lessons, noting that many of the SLM technologies and techniques have been tested and implemented on a small scale or in the region through a large range of projects and institutions. The project will support building upon these experiences. The new Integrated Approach Pilot FAO-GEF[19] project in Burundi will develop an intersectoral knowledge-sharing mechanism at the national and provincial levels—an 'SLM Learning Alliance'—which will identify, document, and develop options and recommendations on tested SLM practices for different agroecosystems. Through the SLM Learning Alliance, the Integrated Approach Pilot (IAP) FAO-GEF project will support the development of a wide range of guidelines, teaching, and extension materials on SLM in the local language, 'Kirundi', and in pictorial forms (illiteracy is about 80 percent among land users in the rural areas in Burundi) ahead of the project implementation, enabling the project to make full use of these materials in the planning, training, and implementation of the proper SLM practices. This subcomponent will guide sustainably maintaining land restoration/erosion protection measures implemented, improving soil fertility and water conservation, crop production, livestock management and fodder production, and preparation and use of compost.

27. Where relevant and requested, the project will also support the establishment of youth FFSs (15–30 years) and female FFSs through reorganizing the FFS farmer groups or by establishing additional/new youth and female FFS groups for the second season of the FFS cycle. Youth FFSs could be more focused on 'farming as a business' or job creation in the agro-sector (growing high-value crops, specializing in specific agricultural practices: pruning fruit trees, compost making, and so on). Female FFSs could focus more on women-relevant topics (food crops, home gardens, nutrition, sanitation and health, livelihoods, and so on).

28. Manure has been key to nurture soil fertility and land productivity of Burundi's intense farming system. However, lack of manure is an issue for most farmers because of the lack of cows/cattle. The

[19] Support for sustainable food production and enhancement of food security and climate resilience in Burundi's highlands, an FAO-GEF project.

Government policy is to support providing livestock to communities through 'solidarity chain', which is widely used in the country and in World Bank-funded projects. The Government policy also encourages a zero-grazing system to effectively collect manure (in enclosures). The project will support livestock (for example, cattle, pigs, and goats) by providing cattle to 20 percent of the households per *colline*, using the solidarity chain method. Capacity building will also include zero-grazing, benefiting both household income and soil fertility and natural regeneration of vegetation. Compost will be an integral part of farm input support to be carried out by farmers or their groups. Cover crops will be promoted as green manure where the lack of livestock is an issue.

Subcomponent 2.3: Land Certification (US$1.8 million)

29. In pursuing the landscape approach when constructing terraces, a practical issue is that terraces would cut across boundaries of lands of multiple owners. Especially in Burundi, where croplands have been fragmented over the decades, the number of landowners operating on one hillside can be substantial. However, land titles have not been established in Burundi, and disputes over land are the most common cause of litigation before courts and other tribunals. Burundi has been engaged in land reform since 2008 and has for almost a decade developed relevant experience through pilot operations to conduct massive land registration and land dispute resolution activities. Yet, current sporadic land certification practices are often only accessible to the wealthy and not sufficiently widespread to address the issue. That is why a systematic approach for land certification has been developed at the *colline* level—all the plots of the entire *colline* are surveyed and each owner can benefit from a land certificate.

30. As it would be important to establish clear boundaries of different plots before starting the construction of terraces, the project will support certification of lands on which terraces will be constructed. Land certification activities will therefore start before the first subcomponent. Among other outcomes, this will address the risk of disputes on land rights once it is treated. Structural works like terracing under Subcomponent 2.1 can then start once it is assessed that any dispute potentially identified has been addressed through early mediation or does not form an obstacle for moving forward while it is being addressed through established processes.[20] In line with the 2011 Land Code, the project will use the approach and systems that have proved robust and effective under recent land certification projects supported by both the Swiss Cooperation and the Dutch in the country. The process will follow an established series of rigorous steps, which promote inclusiveness and accessibility of the process through consultation and participation, community verification of the results (in the form of a public display at the end of the process and the possibility of formally filing an opposition or a request for rectification), an appeal mechanism, dispute resolution, and links to be reinforced with a national registration system. As an innovation and to address an important gender gap, the project will encourage joint signature of husband and wife on land certificates. Land certification offices in each commune where the project will support terracing activities will be established. The project will provide the needed assistance to set up the office and train staff to facilitate individual land certification in the communes. Where such offices exist, assistance will be provided to enhance service provision. Subsequently, the project will support systematic certification for all the land that will be terraced in all the *collines* of the two communes (Isale and Buhinyuza). Project support will include sensitization of the communities, participatory demarcation

[20] Experience suggests that this takes from one to one-and-a-half years to reach that stage.

and characterization of individual plots at the *colline* level, conflict resolution and mediation processes, registration, certificate issuance, and archiving.

Table 1.1. Indicative Chronogram for the Initial Activities under Component 2

		Year 1												Year 2												Year 3											
No.	Activity	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Planning phase																																					
1	Community mobilization	X	X	X	X	X	X																														
2	Land registration		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	Detail physical survey				X	X	X																														
4	Finalize physical plan							X																													
5	Purchasing livestock	X	X	X	X	X	X	X	X	X																											
Preparation for implementation																																					
6a	Social mobilization								X																												
6b	SLM and livestock training (FFS)									X	X	X	X	X	X																						
6c	Community nurseries									X	X	X	X	X	X																						
7a	Available seedlings			X	X	X	X	X	X	X	X	X	X	X	X																						
7b	Available inputs									X	X	X	X	X	X																						
Implementation of landscape restoration works phase																																					
8a	Terracing, agro-forestry															X	X	X	X	X	X																
8b	Bioengineering, water harvesting, and so on															X	X	X	X	X	X	X	X	X	X	X	X										

		Year 1												Year 2												Year 3											
No.	Activity	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
After completion of physical landscape restoration works																																					
9	Intensifying (FFS)																					X	X	X	X	X	X										
10	Livelihood support																					X	X	X	X	X	X	X	X	X	X	X	X				

Component 3: Improved Management of Protected Areas and Reserves (US$3 million)

31. In addition to restoring degraded lands and reducing future soil erosion on these lands, the project will also support measures to prevent further deforestation. Activities under this component will reduce pressure on the forest in and around PAs and reserves. The project will support the implementation of the management plans of the Ruvubu and Kibira National Parks and the Bururi Forest Nature Reserve, respectively. Ruvubu National Park is situated in the east region, while Kibira National Park is found in the northwest region. On the other hand, Bururi Forest Nature Reserve is not located in the two priority regions. The reserve is selected as a priority as it has been supported under the GEF PADZOC and it is deemed imperative to continue the support to sustain the successful results. For each of these parks and reserves, a management plan has already been developed. The project will support implementation of these management plans.

32. It will scale up successful outcomes while addressing major gaps in the implementation of the management plans for the target PAs and support the overall policy and regulatory environment for improving the overall PA system in Burundi. Project activities will promote ecological and biological, economic and financial, social, and institutional sustainability of the PA system. The project will support activities focusing on the communities, including through communication, education, and information on biodiversity; community-led conservation and PA restoration including in monitoring and surveillance; and promotion of income-generating activities to reduce the destructive use of natural resources in addition to the development of ecotourism business plans. The project aims to improve capacity and management effectiveness of the OBPE and community role in decision making around PA management and strengthen partnerships and collaboration with key line ministries and local PA conservation organizations.

33. Specifically, activities will deal with four interconnected main areas, first of which is sustainable management of PAs through (a) the provision of technology, equipment, and resources to strengthen surveillance involving communities and local law enforcement, as well as PA boundary demarcation; (b) development, revision, and implementation of PA management plans to improve biodiversity conservation; and (c) public awareness and education on biodiversity and wildlife.

34. **Activities will also promote jobs and alternative livelihoods around PAs and community-led conservation.** Third, they will focus on the **integration of Batwa communities into PA management activities.** Finally, the project will **promote community-based ecotourism in and around PAs** through the construction and rehabilitation of park infrastructure, wildlife rescue, tourist services training and skills, marketing and promotion of tourism services in the PAs, strengthening of local partnerships, and improvement of PA connectivity.

35. The project will benefit (a) PA communities in and around the PAs in jobs and training; (b) NGOs, local PA conservation groups or associations through capacity building and joint partnerships for service delivery, and communities who indirectly depend on PA services including for water, soil protection, medicinal plants, and aesthetic/cultural values; (c) the Batwa communities through support for their full integration in planning, decision making, and implementation of PA protection activities and in the choice and provision of viable alternative livelihoods for them; (d) the OBPE in skills development and infrastructure; (e) the public sector by strengthening its capacity to manage and regulate ecosystem

services in PA landscapes; and (f) the global community in the preservation of biodiversity of global importance, as well as carbon mitigation.

36. The proposed interventions of the project will align with the five fundamental subprograms of the PA management plan—protection and surveillance, community participation, ecotourism, research and monitoring, and veterinary service. Tackling the related PA system from a landscape approach, the project will support:

- The ecological functioning and biological sustainability of the PA network through community-supported reforestation and restoration activities within the parks and in the buffer/integration zones, basic civil works to enhance park functioning, and ecotourism value;

- **Economic and financial sustainability.** Supporting new and innovative long-term financing through Government allocation for park management, through public-private partnerships, PA community-led investments including in ecotourism and promotion of viable alternative livelihoods' activities, improved partnerships with local park and environment management institutions;

- **Social sustainability.** Public sensitization, communication, education, and dissemination of information on biodiversity to incentivize stakeholder support for PA management involving (a) awareness raising among target communities surrounding the parks on biodiversity conservation and (b) design and production of pedagogical tools adapted to target groups to be used in communication activities, education, and awareness of target groups, integration of Batwa communities into PA management activities; and

- **Institutional sustainability.** Improve park management capacity through adequate staffing, streamlining, and mainstreaming implementation of PA policies and laws and regulations; enhanced monitoring; and improved surveillance program involving local communities.

Component 4: Contingency Emergency Response (Standardized, US$0 million IDA)

37. This contingency component can be triggered by a joint Government and World Bank agreement in case of an emergency. This component had been embedded in the project to finance early recovery and/or specific emergency works, goods, and services, in case of eligible emergencies/crises/disaster caused by natural hazard in the project area. The mechanism is designed to support enhancement of preparedness, early recovery activities, and provision of rapid response to disaster that can be implemented in a relatively short period. This component was considered necessary because of the uncertainty inherent in Burundi's vulnerability to, for example, unexpected flooding or erosion. Reallocation of funds to the CERC can only be done when there is a serious disruption of the functioning of a community or society causing widespread human, economic, or environmental losses that exceed the ability of the affected community or society to cope using its own resources. Following such a disaster event where both the region and national resources cannot sufficiently and adequately address the situation, the GoB may trigger activation of the CERC according to national law and subject to the World Bank's activation policy.

Component 5: Project Management, Coordination, and Monitoring (US$3 million IDA)

38. This component will finance TA, works, goods, workshops, and operational costs to support the project's day-to-day implementation and management, including procurement, FM, environmental and social safeguards, and preparation of annual work plans and organization of audit reports, using a new PCU. The project will also include the design and implementation of a communication strategy that will report on the project results as well as raise awareness about land degradation, restoration and climate change impacts, vulnerability, and adaptation. It will also support the M&E system to report on the expected project's results (disaggregating by gender, where appropriate) and systematize the project's lessons learned. Finally, the project will also finance an impact evaluation to assess the project's impacts on specific elements such as revenues to beneficiary communities and improved livelihoods.

ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY: Burundi
Burundi Landscape Restoration Project

Project Institutional and Implementation Arrangements

1. The implementation arrangements contribute to the overall efforts of Burundi to reduce risks and increase resilience by supporting those Burundians who need help the most. To do that, the project will adopt an inclusive and participatory process for community involvement in decision making and in implementation of the project activities.[21] The project will build conflict-prevention and trust-building implementation arrangements at the local and national levels, involve independent NGOs in the implementation of the components, and include private sector and farmers organizations along with Government's agencies in the Steering Committee of the project.

2. Institutionally, the project will use existing structures, committees, and units at the provincial and commune levels and provide resources/inputs to reinforce their capacity to support project implementation. Where such basic institutions are not existent, as may be the case in some target areas, the project will support the GoB in establishing them.

3. At the national level, the MEEATU will have overall responsibility for project implementation in close coordination with the MINAGRIE and the Ministry of Transport, Public Works, and Equipment.

4. The PCU, with two regional offices, will be hosted by the MEEATU as the executing agency. The PCU will manage the day-to-day operations of the project. It will have the key task of ensuring technical coordination and interaction, at both the central and provincial/local levels as well as between these levels, of the different services and organizations responsible for implementing the respective project subcomponents and activities. Execution of the project components and subcomponent activities will be contracted by the PCU to local, national, and international service providers. Service providers will be selected using a transparent and inclusive process taking into due account demonstrable experience and institutional capacity in the targeted area of concern. Service providers will include local civil works contractors and national and international NGOs. Labor will be supplied by local workforce to be hired from the project area with focus on vulnerable groups, women, youth, and the Batwa people (community labor-intensive works program). To ensure proper oversight, a mixed public-private Project Steering Committee will be established at the national level and mirrored by some multi-stakeholders' technical task force at the provincial level. These arrangements are further detailed below.

Project Implementation Responsibilities

5. The PCU will have the overall responsibility for managing the project. It will be a new PCU, responsible for managing the daily management of the DA, ensuring planning and budgeting of project activities, coordinating project activities, managing subproject agreements/MoUs, FM and procurement, recruiting service providers, technical supervision and quality control, gender and social inclusion, environmental and social safeguards, M&E, and reporting on the project performance to the NPSC and

[21] As recommended in particular by the 2017 RRA (World Bank, Draft).

the World Bank. It will be in charge of executing the approved annual work plan and budget and will be accountable to produce the annual project accounts.

6. The unit will have dedicated personnel. It will comprise Government staff and consultants with expertise in fiduciary domains, relevant technical domains, M&E, safeguards, gender, communication, community mobilization, and administration. The core personnel of the PCU are a National Project Coordinator, an FM Specialist, a Procurement Specialist, an Environmental Safeguards Specialist, a Social Safeguards Specialist, a Communication Specialist, a Landscape Restoration Specialist, an Agriculture Productivity Specialist, a Land Certification Specialist, and an M&E Specialist. The Environmental Safeguards and Social Safeguards Specialists will be in charge not only of project safeguards awareness and accountability but also will follow up on issues related to mediation (if/where required) of potential conflicts and ensure there is no elite capture of project resources.

7. Established at the central level, the PCU will have two decentralized teams at the provincial level, the PPCUs. Staffed each with three or four technical/executive officers, they will contribute to the implementation of the PCU's responsibilities locally. They will ensure the link between central management and local actors, field coordination, guidance, and supervision of project activities. The PPCUs will be established in Muyinga and Bujumbura Rural within the premises of the local governor offices. Staff for the PPCUs will be recruited no later than four months after effectiveness and will comprise an Interprovincial Coordinator (Head of the PPCU), a Land Certification officer, an Agricultural/Livestock Officer, an M&E Officer, and a Secretary. The PPCU teams will oversee and monitor implementation of all project activities in their respective province that will be subcontracted to national and international NGOs/partners. In addition to serving as the project's representatives in the provinces, they will be in charge at the provincial level of coordination as well as the collection, processing, and reporting of M&E data. The PPCUs' staff will work closely with provincial and communal services (Provincial Departments of Agriculture and Livestock, Land Registration Office, and so on). They will provide TA and hands-on training to these services to build Government capacity at the provincial and communal levels and promote the transfer of knowledge between the project and these services.

8. **Transitional arrangement for project implementation.** To ensure fast startup of the BLRRP activities, and as a transitional arrangement for project implementation, the PCU for the ongoing Coffee Sector Competitiveness Project will be entrusted with the initial responsibility for coordination and implementation. During this transition period, the Recipient will establish the new PCU, which will subsequently take over project coordination and implementation from the Coffee Sector Competitiveness PCU within 12 months after the project effectiveness date.

9. **Mobilization of grassroots-level groups will form a central feature of project implementation.** To facilitate peer learning at the grassroots level, existing groups constituted around natural resources and forest landscape management (for example, watershed management groups and FFS Groups) will be strengthened or created as needed. These groups will form the unit for local training, awareness, and community-led monitoring of project performance.

10. For field-level implementation of activities**,** the project will contract different specialized service providers (for example, consulting and civil works firms, NGOs, and technical institutions), most of which are engaged in the NRM activities in the targeted landscape. Service providers will include international

development partners who are active in Burundi and familiar with the social structure, to provide technical support and ensure efficient and transparent implementation of project activities.

11. Hence, under Component 1, the PCU will contract consultancy firms with specialized expertise (for example, in forest and natural resources policies) to address the related analytical and capacity building gaps. The IUCN will conduct the national-level ROAM exercise and train the National ROAM Group.

12. Under Component 2, implementation of Subcomponent 2.1 and Subcomponent 2.2 will respectively fall under the overall responsibility of the MEEATU and MINAGRIE. However, as the activities will require technical support that go across sectors, the respective competent services and agencies of the different ministries will be mobilized to provide support depending on needs.

13. Under Component 2, service providers will be recruited on a competitive basis to support implementation of the Landscape Restoration and Erosion Control activities, that is, manage the community awareness and sensitization, community mobilization for the FFSs, and organization of local labor for civil works. In Bujumbura, selection will be competitive.

14. Local environment and civil works engineering firms will establish the terraces, as well as the bioengineering and water harvesting infrastructure. For improved crop production practices and nutrition activities, the FAO will be engaged to support FFS activities and other selected training activities (including nutrition-agriculture integration) in close collaboration with the MINAGRIE's Directorate General for Mobilization, Self-Development, and Agricultural Extension. Similarly, Bioversity International will support activities related to the provision of agricultural seeds for planting in the restored land, in collaboration with the national agricultural R&D agency ISABU.[22] Seeds and other farm inputs will be distributed with the FAO's support through the FFS groups, in close collaboration with the MINAGRIE's relevant services and agencies, such as the Directorate General for Livestock. In general, the FAO and Bioversity International will actively mobilize and collaborate the relevant national/local services and stakeholders to promote capacity building and institutional sustainability.

15. To implement the land certification activities, a service provider with demonstrated experience in implementing models similar to those proposed under the project, will be recruited to support CLSs and the LRLC. Support will also be provided by the APDH and, for capacity building and guidance, the Permanent Secretariat of the NLC. The project implementation arrangement will support the overall peacebuilding efforts and integrate locally recognized grievance redress approaches adopted for land certification and overall NRM. Hence, CLSs will support implementation of the GRM and conflict redress for land certification. CLSs are newly established *colline*-level commissions that provide local communities access to relatively low-cost land management services. They have primary responsibility for implementing land certification. LRLC will be established at the level of each *colline*. Members include local administration officials and *colline* delegates who are chosen by the community. The LRLC examines the situation of each plots, decides on the merits of the property before land certificate are issued, and helps resolve any land ownership disputes at the *colline* level amicably**.**

[22] ISABU's mandate includes provision of certified seeds, extension services, and applied research activities, soil analysis, and promotion of agricultural best practices in agricultural intensification.

16. Under Component 3 on PAs, the OBPE will supply the tree inputs and technical support for restoration interventions in and around the target PAs. The respective park management teams will manage the program of activities as developed in the respective management plans and following the model successfully implemented for managing the Bururi Forest reserve under the PADZOC. The project will provide them and existing community patrol groups with basic equipment. It will also mobilize NGOs and specialized institutions to implement relevant activities such as livelihood diversification promotion for the local communities.

17. A PIM detailing all project coordination, management, implementation (including matching grants and safeguards), M&E, and reporting arrangement is being prepared under the guidance of the MEEATU. The PIM should be approved by the World Bank by project effectiveness.

18. **Identification of landscape restoration opportunities in these regions.** Landscape ROAM, developed by the IUCN, was used to identify land-use options and priority areas for project interventions in a process that involved social economic survey in communes. Based on the criteria, the selected pilot communes are Buhinyuza in Muyinga and Isale in Bujumbura Rural. The two communes are from two distinctive agroecological regions and will offer lessons for other communes in the respective regions.

Project Oversight Responsibilities

19. **The NPSC**, chaired by respective Permanent Secretaries of the MEEATU (Chair) and MINAGRIE (Vice Chair), will provide policy guidance and oversight. Meeting at least twice a year, its main functions and responsibilities will entail the following:

(a) Advise the project on strategic directions and support activities to be provided;

(b) Approve the project annual work plan and budget and ensure that they are aligned with the PDO;

(c) Ensure the effective collaboration and cooperation between all key stakeholders, including at the regional level; and

(d) Review the PCU's Implementation Progress Reports and advise on the effectiveness of ongoing activities and any adjustments that need to be made to the annual work plan.

20. It will comprise a mix of public and private members to include civic society in oversights of projects, building public-private partnership, and mutual responsibility, including

(a) The Permanent Secretary of MEEATU (Chair);

(b) The Permanent Secretary of MINAGRE (Vice-Chair);

(c) The Permanent Secretary of the Ministry of Finance, Budget, and Privatization;

(d) The Permanent Secretary of the Ministry of Communal Development;

(e) The Provincial Governors of the project area (Bujumbura Rurale and Muyinga);

(f) The Permanent Secretary of the NLC;

(g) A farmers' federation representative (FOPABU);

(h) An environmental organization representative (AFEB);

(i) A private sector representative (Federal Chamber of Commerce and Agriculture); and

(j) An NGO representative.

21. The NPSC will also organize at least one annual meeting with donor representatives to ensure adequate coordination of environment and rural sector development activities. The establishment of the NPSC is a condition of effectiveness.

22. **A Technical Committee**, which was established to provide multifaceted guidance and support during project design, will meet depending on needs, to promote effective interaction between the different implementation entities and provide them with technical guidance, for example, on innovation, technologies, and best practices. Members may include Government agencies and development partners, universities and research institutions, the private sector, and NGOs that have relevant expertise in project scope.

23. **Provincial local task forces** will be set up at the provincial level with similar responsibilities, locally, as the NPSC, including in terms of promoting effective interaction and coordination between the implementing entities. Chaired by the Provincial Governor, they will meet four times per year and involve the respective PPCUs, commune administrators involved in the project, local public and private sector implementation partners, NGOs, and local university or research institution.

Financial Management

24. For the proposed project, it has been agreed that a new PCU will be established to ensure the day-to-day coordination of the project's FM activities. The objective of the FM assessment of the implementing unit was to determine (a) whether there were adequate FM arrangements in place to ensure the funds will be used for the intended purposes in an efficient and economical manner and capable of correctly and completely recording all transactions related to the project; (b) the project's financial reports will be prepared in an accurate, reliable, and timely manner; and (c) the project assets will be safeguarded. The FM assessment was carried out in accordance with the World Bank Directive: Financial Management Manual for World Bank Investment Project Financing Operations, issued February 4, 2015, and effective from March 1, 2010, and the Bank Guidance Financial Management in World Bank Investment Project Financing Operations, issued and effective February 24, 2015. Key risks include the absence of a PCU to coordinate the project's activities. In addition, the project will manage a large number of transactions; the inherent country fiduciary risk is high; cash for community labor-intensive activities, risky by nature, accounts for over 50 percent of the total cost; and there will be a significant number of beneficiaries and agreements with technical agencies during the project implementation. Additional risk includes the Government preference for a new PCU to be established instead of using an existing one. The PCU staff recruitment will follow a rigorous process to ensure full transparency. The conclusion of the assessment is that **the FM risk is assessed as High**. The risk will be mitigated through many measures

including the use of the Coffee Sector Competitiveness PCU until the new PCU is established, the recruitment of qualified and experienced fiduciary staff, the development of the PIM, and a computerized accounting system. Once the risk mitigation measures are implemented, the residual risk rating should be Substantial.

25. **Implementing entity.** The PCU will have overall responsibility for aspects of project FM and procurement, including budgeting, disbursement, bookkeeping, reporting, supervision, management of the DA, and so on. The financial team will be composed of at least one FM expert and one accountant.

26. **The PCU/FM Unit** will be responsible for ensuring compliance with the FM requirements of the World Bank including preparing and submitting the quarterly unaudited interim financial reports (IFRs) and audited annual financial statements (AFSs) to IDA. It will maintain adequate FM arrangements to support the deployment of project resources in an economic and effective manner to achieve the stated development objectives.

27. **Planning and budgeting arrangements.** The AWPB, along with the disbursement forecast, will be developed by the PCU with input from different implementing entities both at the central and decentralized levels. Review and approval process as well as the budget will be detailed in the project manual and monitored by the fiduciary unit within the PCU. The quarterly IFRs will be used to monitor the execution of the AWPB.

28. **Accounting arrangements.** The current accounting standards in use in Burundi for ongoing World Bank-financed projects will be applicable to the proposed project. An integrated financial and accounting system will be purchased. It will be multiple projects software and generate reports such as the IFRs. The project code and chart of accounts will be developed to meet the specific needs of the project and documented in the PIM. The FM software should be operational no later than three months after the effectiveness of the project.

29. **Internal control and internal auditing arrangements.** Key administrative and accounting procedures, with key internal control procedures from transaction initiation, review, approval recording, and reporting will be developed with clear segregation of duties.

Table 2.1. Risk Assessment and Mitigation Measures

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
Inherent risk	**S**			**S**
Country level. Burundi is a high-risk country from the fiduciary perspective. The PEFA (2008, 2014) as well as the UCS reports outlined weaknesses in PFM at both the central and decentralized levels.	H	The Government is committed to a reform program that includes the strengthening of PFM. This project will enhance the Government's institutional capacity to adopt and use IDA FM procedures.	N	H

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
Entity level. The MEEATU has limited capacity in managing World Bank–financed projects. Giving fiduciary responsibility to the civil servants may undermine the FM performance of the project.	S	New PCU to be established. The PCU will be staffed with competent and experienced staff. The recruitment process is transparent. Some adjustments may be necessary and would be determined during the project implementation to allow progressive use of country fiduciary systems.	N	S
Project level. Weak FM performance as a result of lack of competence and experience of key fiduciary staff. The project is complex with several agencies, thousands of beneficiaries, CBOs, and so on, while there is no FM arrangement at the decentralized level. This may inherently place a high-risk exposure to the proper use of project funds.	S	New PCU to be established. Competent and experienced fiduciary staff will be recruited. The Coffee Sector Competitiveness PCU will provide technical support during the transitional period 12 months maximum. The PCUs at the province level will have no fiduciary responsibility. They will receive some advances (a 60-day) based on already agreed activities in their budget. A PIM (including FM procedures) will be developed for the execution of the project. The PCU will not deal with the communities for labor-intensive works, and the CBO concerned by the project.	N N	M
Control Risk	**S**			**S**
Budgeting. The AWPB may not be reliable or may not reflect project needs. Risk of cost overruns and adverse variations in expenditure could arise due to potential slow implementation and depreciation of local currency.	H	The project Financial Procedures Manual (which will be part of the PIM) will define the arrangements for budgeting, budgetary control, and the requirements for budgeting revisions. Annual detailed disbursement forecasts and budget will be required. The IFRs will provide information on budgetary control and analysis of variances between actual and budgeted expenditure. Capacity-building activities may be provided to support preparation of a reliable budget. A note to the budget will explain variation resulting from payment of contracts denominated in a foreign currency.	N	S

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
Accounting. Poor policies and procedures and delays in keeping reliable and auditable accounting records	S	Accounting procedures will be documented in the Procedures Manual. The FM functions will be carried out by qualified staff. Accounting process and transparency will be taken care of during the installation of the new software.	N	S
Internal control. Weak internal control system because of a lack of clarification of the roles and responsibilities of key players involved in project management. The large number of players and beneficiaries poses key risks.	H	The PIM will outline procedures for internal control that will be applied and monitored by the project. Also, FM supervision and capacity-strengthening activities will contribute to mitigate the risk relating to internal control. Staff well-versed in World Bank FM procedures will be recruited. The Coffee Sector Competitiveness PCU will handle the FM activities during the transition. During the implementation, the project may consider appointment of an internal auditor.	N	S
Funds flow. The risks include delays in disbursing funds to finance the project's activities and delays in the replenishment of the DA. The project will pay a large number of beneficiaries; Cask for labor-intensive works account for over 50% of the total financial resources and involve thousands of beneficiaries. DA in the Central Bank may delay payment of some suppliers especially those with contracts denominated in a foreign currency.	H	Experienced staff familiar with disbursement procedures to be recruited. The project will not deal directly with the beneficiaries of community labor-intensive works, the CBO, but will have limited number of contracts with limited service providers (NGOs, Swiss Cooperation, IITA, Bioversity, FAO, and so on) who will be in charge of coordinating activities in the field and paying the beneficiaries and CBO. Frequent implementation support by the bank Financial Management Specialist (FMS), if required. Celling for direct payment for contracts denominated in foreign currencies will be revised to allow more direct payments.	N	S

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
		The World Bank, in collaboration with the PCUs, is working to improve the efficiency of the Central Bank.		
Financial reporting. Inaccuracy and delays in the submission of IFRs; No computerized accounting system in place	H	The project will acquire a new software that will allow automatic generation of more reliable and accurate information. The IFRs and financial statement formats and contents have been agreed upon. FM staff with required skill, experience, and competencies will be recruited to coordinate the project activities. The Coffee Sector Competitiveness PCU will provide technical support during the transition. Comments provided by the World Bank during reviews of the reports will help improve their quality.	N	S
Auditing. Poor quality audit Delays in submitting financial audit reports; Delays in the implementation of audit recommendations	H	Only qualified audit firms will be short-listed. The terms of references (ToRs) for the auditor as well the short list will be reviewed by the World Bank. The IFR will be produced on a quarterly basis and the project financial statements will be made available by three months after the end of the year.	N	M
Governance and accountability. Possibility of circumventing internal control and abuse of administrative positions are potential risks; mis-procurement and so on, is a critical issue.	H	(a) PIM including FM Procedures Manual will be developed for the implementation of the activities of the project; (b) robust FM arrangements will be designed and their operating effectiveness monitored during FM implementation support missions; and (c) measures will be taken to improve transparency such as providing information on the project status to the public; and (d) FM supervision will be increased, if necessary.	Y for (a)	S
OVERALL FM RISK	**H**			**S**

Note: H = High; S = Substantial.

30. **Reporting arrangements.** The PCU will record and report on project transactions and submit to the World Bank IFRs no later than 45 days after the end of each calendar quarter. At a minimum, the financial reports must include the following tables with appropriate comments: (a) Sources and Uses of Funds, (b) Uses of Funds by Project Activity/Component and comparison between actual expenditures and budget, (c) DA activity statement, and (d) notes to the IFR. At the end of each fiscal year, the project will issue the project financial statements, comprising (a) a balance sheet, (b) a statement of Sources and Uses of Funds, (c) accounting policies and procedures, and (d) notes related to significant accounting policies and accounting standards adopted by management and underlying the preparation of financial statements. The reporting requirements from the PCUs to the PCU will be determined in the PIM.

31. **External auditing arrangements.** An independent and qualified external auditor will be recruited on approved ToRs. The external audit will be carried out according to International Standards on Auditing and will cover all aspects of project activities implemented and include verification of eligibility of expenditures and physical verification of goods and services acquired. Audit reports must be submitted to IDA within six months after the end of each fiscal year. The project will comply with the World Bank disclosure policy of audit reports (for example, making them publicly available promptly after receipt of all final financial audit reports, including qualified audit reports) and disclose the report on the official website within one month after the final version is accepted.

32. **Funds flow arrangements.** Funds will flow from the grant account to the DA opened at the Central Bank by the Government. The PCU staff will operate on the account at the Central Bank. Given the complexity of channeling funds for activities at the community level such as labor intensive works, the project will channel funds to a limited number of service providers (NGOs, Swiss Cooperation, IITA, Bioversity, FAO, and so on) on the basis of agreed contracts. Therefore, sophisticated or complex types of instruments such as mobile money are not applicable in this project. Direct payment method will be mainly used for contracts denominated entirely or partly in foreign currencies (25 percent).

33. **Governance and accountability.** The risk of fraud and corruption within project activities is substantial, given the country context, the nature of the project (community labor-intensive works account for over 50 percent), and the variety of key players involved. The effective implementation of the proposed fiduciary mitigation measures should help strengthen the control environment. Also, appropriate representation in, and adequate oversight by, the NPSC; transparency in implementing project activities; and sound communication to and with stakeholders and public should constitute a good starting point to tackle governance and corruption issues during project implementation.

34. **FM Action Plan.** An FM Action Plan has been developed to mitigate the overall FM risks.

Table 2.2. Overall FM Risks

No.	Action	Due By	Responsible
1	Recruit a qualified and experienced FMS and an accountant	12 months after project effectiveness	Government with the support of Coffee Competitiveness PCU
2	Develop the Project Implementation Manual that includes FM procedures	By the effectiveness date of the project	Government with the support of Coffee Competitiveness PCU

3	Acquire an off-the-shelf project accounting package that would be used to maintain the project accounts	Three months after the project effectiveness	PCU
4	Recruit an independent audit firm for the audit of the project financial statements (short list and ToR submitted for World Bank 'no-objection')	Six months after project effectiveness Two months after the project effectiveness	PCU PCU

35. **Supervision plan.** Supervision missions will be conducted over the project's lifetime. The project will be supervised on a risk-based approach. Supervision will cover but not be limited to the review of the audit reports and IFRs and advice to the task team on all FM issues. Based on the current residual risk rating (Substantial), the project will be supervised at least twice a year and the frequency may be adjusted when the need arises.

Table 2.3. Implementation Support Plan

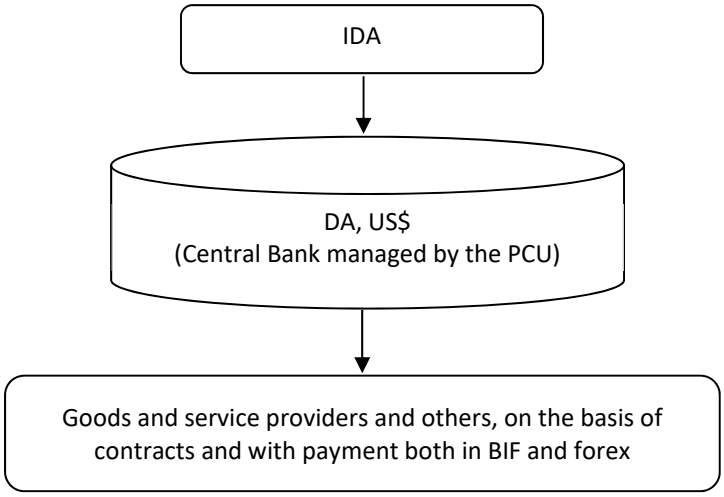
FM Activity	Frequency
Desk reviews	
IFR review	Quarterly
Audit report review of the program	Annually
Review of other relevant information such as interim internal control systems reports	Continuous as they become available
On-site visits	
Review of overall operation of the FM system	Semiannually (implementation support mission)
Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit, and other reports	As needed, but at least during each implementation support mission
Transaction reviews (if needed)	As needed
Capacity-building support	
FM training sessions by World Bank FM team	Following the project transition and thereafter, as needed

Disbursements

36. A DA will be opened at the Burundi Central Bank on terms and conditions acceptable to IDA under the fiduciary responsibility of the PCU. The ceiling of the DA was set during negotiations. Replenishments to the DA will be made against withdrawal applications supported by Statements of Expenditures or records and other documents as specified in the Disbursement Letter. Upon project effectiveness, transaction-based disbursements will be used. The option to disburse against submission of quarterly unaudited IFRs (also known as report-based disbursements) could be considered subject to the quality and timeliness of the IFRs submitted to the World Bank and the overall FM performance as assessed in due course. The other methods of disbursing funds (reimbursement and direct payment) will also be available to the project. The project will have the option to sign and submit withdrawal applications electronically using the e-Signatures module accessible from the World Bank's Client Connection website. Details will be provided in the PIM.

37. In addition to the DA, the project will open an account denominated in Burundi francs at a commercial bank to capture revenue resulting from the sale of bidding documents and balances on expenses not entirely spent.

Figure 2.1. Flow of Funds



Procurement

38. **Applicable procurement rules and procedures.** Procurement will be carried out in accordance with the Procurement Regulations for IPF Borrowers, namely Procurement in Investment Project Financing (IPF): Goods, Works, Non-Consulting and Consulting Services, dated July 1, 2016; Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (revised as of July 1, 2016); and provisions stipulated in the Financing Agreement. For national competition, the borrower and the World Bank will agree on provisions to consider for the bidding document to be used for consistency between national procurement procedures and the new procurement framework. Those provisions will include, among others, provisions for confirming the application of, and compliance with, the World Bank's Anti-Corruption Guidelines, including, without limitation, the World Bank's right to sanction and the World Bank's inspection and audit rights.

39. **Procurement arrangements for value for money in achieving the PDOs.** In accordance with the requirement of the new Procurement Regulation, the borrower prepared a short-form Project Procurement Strategy for Development (PPSD) in August 2017 that was reviewed and finalized for Board presentation. The market analysis found that contractors, suppliers, and service providers already exist both nationally and internationally, with sufficient competition and capacity. However, for some consultancies requiring technical expertise for which no suitable private sector alternative exists, the project would rely on specialized research institutes/centers through direct selection.

40. The PPSD provides the basis and justification for procurement approaches and decisions including market analysis and selection methods. The PPSD also reviewed the experience and capacity of implementing agencies in conducting the type of procurement activities required by the project.

41. **Systematic Tracking of Exchanges in Procurement (STEP).** The project will use STEP, a planning and tracking system, which will provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance.

42. **Oversight and monitoring arrangements for procurement.** Given that the implementing unit possesses limited capacity, a need for expanded hands-on implementation support from the World Bank pertaining to procurement may be considered. It is also noted that no single contract will require review by the Operational Procurement Review Committee or involve the use of negotiations or competitive dialogue. A Procurement Plan outlines the procurement procedures to be used to plan and monitor implementation of investment activities; that plan (an output of the PPSD) was prepared and agreed upon by the GoB and the World Bank. For each contract to be financed by the project, the different procurement or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frames should always be agreed between the recipient and the World Bank through the Procurement Plan. The Procurement Plan may be updated at least every 12 months, or as required, to reflect the actual project implementation needs, but each update shall require World Bank approval. All Procurement Plans will be publicly disclosed in accordance with the World Bank's disclosure policy.

Environmental and Social (including safeguards)

43. The new PCU, which will comprise Government staff and consultants with expertise in safeguards and gender, will have overall responsibility for the environmental management of the project. It will be responsible for ensuring monitoring and supervision, and reporting on the project performance to the NPSC and the World Bank. Established at the central level, the PCU will have decentralized teams at the provincial level, the PPCUs. These will ensure the link between the central management and the local actors. The project is adequately equipped to take on this task and will strengthen the safeguards function of the PCU with the recruitment of a Social Safeguards Specialist and an Environmental Safeguards Specialist, as well as additional resources for training of key actors at the provincial and community levels. The OBPE will be entrusted with an oversight function to ensure that national laws and procedures are being properly implemented. To ensure compliance with national laws and procedures, the OBPE will be entrusted with an oversight function in the overall monitoring and supervision of all environmental protection and mitigation measures that will be developed and enforced. An MoU will be signed between the PCU and the OBPE to conduct this task.

44. As indicated, an Environmental Safeguards Specialist and a Social Safeguards Specialist will be recruited and integrated within the PCU. The experts' role will be to monitor progress of the different environmental and social management systems that will be established, build up a database, develop indicators, ensure that all the stakeholders are properly briefed and coordinating among themselves, and provide expert advice as and when required. These specialists will be assisted by two Regional Environmental and Social Experts to be stationed at the two regional offices. At the communal level, it is proposed to train and equip local environmental and social agents who will be responsible for the day-to-day implementation and supervision of environmental protection measures. The two Regional Experts will constitute a crucial link between the communal agents and the National Expert.

Monitoring and Evaluation

45. The M&E system will provide the suitable data needed for assessing the project performance and guide the timely adoption of corrective measures. The M&E framework of the project will be described in the PIM and will be based on the following: (a) the project results chain and underlying assumptions of theory of change; (b) alignment with complementary M&E framework at the country level; and (c) compliance with the World Bank Group requirements, including the selection of key core indicators as well as specific indicators for gender and civic engagement.

46. Central to the project's results chain is its theory of change. The theory of change is built around the following core pillars: (a) social sustainability: the PDO will only be achieved if conflicts between and within communities in the targeted areas are prevented, especially around productive resources such as land and water; (b) financial sustainability: the PDO will only be achieved if beneficiaries gain income increased; and (c) environmental sustainability: the PDO will only be achieved if the natural resources capital is managed sustainably and its services maintained, especially production-related services.

47. There will be an M&E Specialist at the PCU who will provide technical support at the provincial and local levels to guide data collection and project monitoring against the results framework and other project guidelines, as outlined in the PIM.

48. The M&E arrangements will also be considered in the FFS curricula in which tools such as ROAM, SLM, and agribusiness will be developed, assessed, and monitored. The M&E Specialist at the PCU will develop tools at the national, provincial, and local (FFS) levels. Stakeholders will be trained on how to use these tools for data collection and reporting.

Role of Partners

49. See 'Implementation Arrangements' earlier, with regard to NGOs, the IUCN, Bioversity International, and FAO.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN
COUNTRY: Burundi
Burundi Landscape Restoration Project

1. Implementation support for the project will focus on the functions and activities typically monitored by the World Bank task teams during supervision, including monitoring of technical activities, management functions (administration, FM, procurement), and compliance with safeguards policies. In addition, special attention will be directed to ensuring the timely implementation of the risk mitigation measures identified in the Systematic Operations Risk-Rating Tool (SORT) matrix. The implementation support strategy is flexible and is likely to be amended during implementation in response to the evolving needs of the project, including changes in the institutional context and in the event of an emergency/crises.

Strategy and Approach for Implementation Support

2. The implementation support strategy includes the elements discussed in the following paragraphs.

3. **Timely support.** The World Bank's implementation support will begin immediately after Board approval, to help the borrower achieve effectiveness on time (this will involve formally establishing the PCU and recruiting key staff and signing agreements with co-implementing partners/agencies). Due to the plan to use existing systems and arrangements in some cases, the frequency of supervision missions may be maintained at the usual two missions per year after the project reaches a good implementation pace. However, provisions would be made to provide close monitoring especially during the first year of implementation.

4. **Continuously strengthening capacities.** The MEEATU has, in the past, successfully implemented World Bank-funded operations such as LVEMP II (closed December 2017). Most of the capacities installed during the implementation of this project remain; and a partnership with MINAGRIE would benefit both the project and the institutions. World Bank operations, fiduciary, and safeguard trainings will be provided early on to staff in the new PCU to be established. In addition to carrying out their usual implementation support functions, the World Bank Fiduciary and Safeguard Specialists will be available to provide close support and detailed hands-on guidance to their counterparts during the initial months following effectiveness and as the new unit is being established.

5. **Continuously assessing the effectiveness of implementation arrangements.** While the governance risk associated with these partner relations is high, the relationship between the World Bank and the project-executing entities is expected to be strengthened during implementation. There are some risks related to the implementation agencies, specifically with regard to effective coordination within the national implementing agencies and between them and the local/regional institutions. Additionally, some of the activities involved are relatively challenging, especially those aimed at supporting coordinating platforms at the local level, where interventions will be taking place mostly, with the national (ministerial) level while keeping a landscape-level lens. This will also require the establishment of an efficient working relationship between the PPCU and the PCU, between the MEEATU and MINAGRIE and among relevant partners. Therefore, special attention would be given by the World Bank team to continuously assess the

effectiveness of coordinating arrangements. An in-depth review of such arrangements will be carried out at the end of the first year of implementation.

6. **Technical support.** The project will support a wide range of activities designed to strengthen the capacity of the implementing agencies. The World Bank task team will include Technical Specialists with expertise in a range of areas, drawn from within the institution. Technical Specialists with expertise in other areas may be recruited externally, as needs are identified. Field visits will focus on verifying compliance with the policies and procedures spelled out in the Implementation Manual, identifying bottlenecks that may be impeding implementation progress, and offering recommendations designed to overcome those bottlenecks.

7. **Capacity.** Strong implementation support will likely be needed while some staff of the PCU climb the learning curve. For this reason, the World Bank task team would be prepared to schedule additional implementation support missions, if needed, during the first year of implementation.

Fiduciary aspects. World Bank fiduciary specialists will provide early procurement support to the PCU and the PPCU. The World Bank Procurement Specialist and FM Specialist assigned to the project are both based in Burundi, so they will be available to avoid initial delays in submitting withdrawal applications, performing FM activities, and processing procurement requests. The annual Procurement Plan will allow the executing agencies to plan the use of funds based on actual opportunities and needs. An audit of annual project financial statements will be conducted by an independent auditing firm and in accordance with the ToR acceptable to the World Bank.

8. **Safeguard compliance.** To ensure an effective implementation of the environmental management systems to be set up under the project, the PCU will be reinforced with two additional Safeguards Specialists, and the task of the overall monitoring of compliance with national laws and procedures will be entrusted to the OBPE. An MoU will be signed between the PCU and the OBPE for conducting this task. The Safeguards Specialists' role will be to monitor progress of the different environmental and social management systems that will be put in place, build up a database, develop indicators, ensure that all the stakeholders are properly briefed and coordinating among themselves, and provide expert advice as and when required. They will be assisted by two Regional Environmental and Social Experts to be stationed at the two regions. At the communal level, it is proposed to train and equip local environmental and social agents who will be responsible for the day-to-day implementation and supervision of environmental protection measures. The two Regional Experts will constitute a crucial link between the communal agents and the National Expert.

9. **M&E.** The dedicated M&E staff in the PCU will be responsible for developing, setting up, and maintaining the project's decentralized M&E system, which will systematically collect information needed to track progress achieved against the PDO, generate financial information, and document compliance with safeguards policies. Information generated by the M&E systems, complemented by information emerging at the time of the midterm review, will be used to adjust operational procedures and make any necessary mid-course corrections to the project implementation modalities.

Implementation Support Plan and Resource Requirements

10. The main focal areas of projected implementation support activities are summarized in the following table, including required skills. Implementation support is expected to be more intense during the first 12 months. Implementation support missions will be reduced from three to two in the years following the first year, although support provided by country office-based members of the task team will remain continuous.

Implementation Support Plan

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First 12 months	Project establishment; Establishing fiduciary systems; Communications strategy development and implementation; Environmental and social aspects in place; Establishment of committees/units and Project Council (and ad hoc working groups as needed); Establishment of cooperation agreements with partners, and so on; Setting up M&E system	Task Team Leader, Environmental Specialist, Agribusiness/Agriculture Specialist, Procurement Specialist, Social Specialist, FM Specialist, Environmental Specialist, NRM Specialist, Natural Resources Economist, Legal team, Procurement Specialist, and FM Specialist M&E Specialist, Communication Specialist	42 staff weeks (SWs)	—
13–60 months	Program implementation Communication activities Monitoring Reporting	Task Team Leader, Environmental Specialist, Agribusiness/Agriculture Specialist, Procurement Specialist, Social Specialist (Fragility, Land Certification), FM Specialist, NRM Specialist, M&E Specialist,	124 SWs	—
Other				

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Safeguards (social, indigenous peoples, and environment; other safeguards per project documents)	World Bank supervision will require 8 SWs for the first fiscal year and 6 SWs in subsequent years (mainly senior technical staff)	Two trips per fiscal year	—
Technical expertise enhancement (PA, land-use planning, M&E, knowledge sharing, technical support: Terracing, Fragility, Land Certification Specialist, and so on)	World Bank supervision will require 24 SWs for the first fiscal year and 18 SWs in subsequent years (mainly senior technical staff)	Three trips first FY and subsequently, two trips per year	—
Institutional capacity strengthening (FM, procurement, and disbursement)	10 SWs for the first fiscal year and 7 SW in subsequent years (mix of junior and senior technical staff)	Two trips per fiscal year	—

ANNEX 4: ECONOMIC ANALYSIS

COUNTRY: Burundi
Burundi Landscape Restoration Project

1. The BLRRP addresses land erosion in Burundi's hills with an integrated set of interventions and mutually reinforcing activities to increase agricultural productivity and farmers' income on hillsides in selected rural areas. Project activities will bring different types of benefits affecting different areas. Improved land management practices and reforestation will significantly raise production and productivity, effectively retain sediment, and contribute to flood prevention. Livelihood improvements planned to take place around PAs will result in improved ecosystem services in Burundi and will help reduce the pressure on natural resources in these areas. To complement these land management interventions, institutional developments are also needed to ensure that the benefits will be attained and be maintained over a long period. Both aspects receive strong support from the project.

2. This annex covers the economic analysis for this project. The economic analysis has focused on the benefits generated through activities of Component 2, where the majority of direct project impacts on the economy, environment, and population are expected. The other three components are expected to support the success of the project, thus indirectly contributing to the project benefits. Because not all project sites for Component 2 have been identified, quantitative analysis was not easy to conduct for the entire project. Hence, the quantitative analysis focused on the two communes where the first phase of activities will be implemented and extrapolated the results obtained for these two communes to the rest of the project.

3. For the intervention sites of the first phase of the project, the economic costs and benefits of the project were estimated and compared to calculate the NPV and ERR, and benefit-cost (B/C) ratio.

Costs

4. For the economic analysis, the BLRRP, which will run for five years and has five components, is assumed to amount to a total of US$30 million (including physical and price contingencies). Component 1 is Institutional Development and Capacity Building for Landscape Restoration and Resilience, organized along (a) policy support and watershed planning activities and (b) capacity development activities at the national and local levels. Component 2 is Sustainable Landscape Management Practices, composed of the following subcomponents: (a) Improved landscape restoration and erosion control, (b) Improved practices of crop production and nutrition, and (c) land certification. These costs will vary with the number of hectares, *collines*, and households targeted by the project. The second components integrate FFS costs. The third component is Improved Management of Protected Areas and Reserves; the fourth is the Contingency Emergency Response Component (CERC); and the fifth, Project Management, Coordination, and Monitoring. Table 4.1 shows the estimated cost under each component/subcomponent.

Table 4.1. Estimated Cost of Project

Component/Subcomponent	Estimated Cost (US$)
Component 1. Institutional Development and Capacity Building for Landscape Restoration and Resilience	2,000,000
Component 2. Sustainable Landscape Management Practices	22,000,000
Component 3. Improved Management of Protected Areas and Reserves	3,000,000
Component 4. Contingency Emergency Response (CERC)	0
Component 5. Project Management, Coordination, and Monitoring	3,000,000
Total estimated cost	**US$30 million**

5. The technical life of these assets was estimated to be 25 years for soil conservation measures, including radical terraces. This analysis adopted the most conservative figure and estimated the cost and benefit stream for a 20-year period.

6. This analysis used a discount rate of 20 percent,[23] which is the most appropriate given the scarcity of capital in Burundi and being the standard rate mostly used as cost of capital in Burundi projects and in similar contexts in the Africa region. Given these assumptions, the present value of the cost of the BLRRP is US$17.5 million.

Benefits

7. Project activities financed through the BLRRP are expected to generate three main benefit streams: (a) on-site private benefits within the project area, (b) downstream benefits of the project area, and (c) global public benefits originating in the project area but enjoyed beyond the project area. Some of these are more easily quantifiable than others. Downstream public benefits are those spillover effects (positive externalities) essentially related to the ecological function of land and forests which produces on-site effects as well as transboundary effects at a larger level (off-site). For example, they can come from reduced sediment loads and reduced flood risks, which can be measured through maintenance costs otherwise incurred to reduce sediment loads in river, reduction on the cost of flood protection, and reduction on the costs of flood damages.

8. Global public benefits include all benefits that can accrue to everybody including local, national, and global communities. They can be either direct benefits or spillover effects, including direct use values of genetic materials provided by nature and indirect use value in the form of carbon sequestration on agricultural lands and in forests. Critical to the estimation of benefit streams from the BLRRP was the determination of the 'without-project' or counterfactual scenario. Socioeconomics studies in the 12 initial project sites were conducted as an activity of project preparation to document the adopted crop mix, production and yield levels, farm-gate prices, other economic activities, and household characteristics. Using available data, a representative mix of grown products was developed for the two provinces.

[23] This high discount rate corresponds to the annual interest rate at 16 percent in Burundi. (http://www.tradingeconomics.com/burundi/interest-rate) and high risk of agricultural production in Sub-Saharan Africa, as reflected in Wroblewski and Hendrik (2010) Risks to Agribusiness Investment in Sub-Saharan Africa, Evans School of Public Affairs, University of Washington.

9. Third, externalities such as reduction of sedimentation in rivers, reservoir, and other downstream areas; reduction in floods and landslides; and global benefits of mitigating global warming were included in the economic analysis.

On-site Private Benefits

10. On-site private benefit streams are tangible benefits at the project area, which mainly come through direct income increases, improved food security, and reduction in food availability fluctuations. These include the following:

(a) Increased value of production in terraced areas. Improved soil conservation practices would improve the integrity of the soil structure and, as a result, would reduce soil erosion. Because of the provision of livestock in some cases, there will be an increase in the volume of manure used to replenish soil fertility. Continued use of this manure will improve soil fertility and sustainably improve the yields.

(b) Increased income from trees, shrubs, and grass planted and grown in association with terrace construction and for broader erosion control.

(c) Avoided yield loss due to land degradation, in particular soil erosion.

Increased Value of Production in Terraced Areas

11. Past studies show that yield increase due to soil conservation such as progressive terraces ranges from 10 percent to 30 percent. The yield increase for appropriately prepared cropland on radical terraces is supposed to be higher but as the number of radical terraces is going to be negligible in this project, they will not be considered in this analysis. After discussions with the project experts, a conservative value of 20 percent is used. The benefit attributed to the BLRRP was the difference between the gross margin of the current cropping pattern and new gross margin with these increases in yield value using local farm-gate price.

12. Based on the assumption on yield increase, annual benefit amounts to US$3.3 million, and the present value is US$10.4 million, assuming a 20-year period of benefit stream and 20 percent discount rate.

13. A substantial range of products could be grown as part of the BLRRP. These products will form part of the options assessment and package from which beneficiaries from the FFS will choose. For the analysis, assumptions on a restricted set of products were made to conduct the analysis. Because information on the viable markets in the various potential project locations was not available, a very conservative approach was selected so as not to modify the breakdown of products grown by the targeted households.

Increased Income from Trees, Shrubs, and Grass Grown around Terraces or in Zones of Livelihood Restoration

14. The project should enable the development of approximately 9,000 ha of forest. Raw wood from the canopy and side branches can be raw materials for production of charcoal or direct use by households

for cooking purposes. Given the speed of forest growth, it was assumed that the new forest is able to produce 15 m^3 per ha of wood per year, beginning seven years after the forest has been planted. Using the price of a coal bag as an indicator, raw material for cooking value amounts to US$244 per ha in areas far from Bujumbura and to US$488 per ha close to Bujumbura (bag of coal: BFI 30,000 in Bujumbura and BFI 15,000 elsewhere). This leads to a present value of US$3 million, assuming a 20-year period of benefit stream and 20 percent discount rate.

Avoided Yield Loss That Would Occur 'Without Project'

15. Without the BLRRP, yield loss on hillsides caused by soil erosion and nutrient depletion over the years can be substantial (see table 4.2).

Table 4.2. Soil Degradation by Ecoregion in Burundi

Ecoregions	Imbo	Mumirwa	Congo-Nile Watershed	Central Plateau	Northeastern Depressions
Erosion (t/ha/year)	2.5	100	21.5	18	2.6–4
Area, hectares; share of the total area	194,000 7%	270,000 10%	410, 000 15%	1,237,000 44%	670,000 24%

Source: CEA report 2017.

16. Assuming that highly eroded lands are not used for agricultural purposes, and using data from the CEA report, the Land Husbandry, Water Harvesting and Hillside Irrigation (LRW) Project in Rwanda, and the *Étude sur les coûts de l'inaction contre la dégradation des sols au* Burundi report, a conservative value of yield loss of 2 percent per year is used (values ranging from 0.5 percent to 25 percent were determined, but this value was finalized after discussion with the local experts). Then the total present value of the avoided yield loss of US$7.1 million is for the length of the project.

Downstream Benefits of the Project Area: Savings from Cost of Sediment Load Removal

17. In addition to avoidance of yield losses, land management activities under the BLRRP can contribute to reducing sedimentation in rivers and downstream reservoirs. As a measure of this benefit stream, an estimate of the potential cost of removing sediment loads was used as a proxy.

18. In the literature, the cost of removing sediment loads is estimated to be US$2.50 per ton (used in the Madagascar Irrigation and Watershed Management Project) and US$8–25 per ton (used in the Kenya Agricultural Productivity and Sustainable Land management Project). The same value as the Land Husbandry, Water Harvesting and Hillside Irrigation Project will be used here—US$14 per ton. Afforestation activity on about 9,000 has been estimated to reduce sediment loads of 10,125 tons per year; once again the value of the Rwanda LWH Project was used (1.125 ton per ha per year, to be compared to 1.8 ton per ha per year in the Kenya APSLM Project and to 0.45 ton per ha per year that was used in the Madagascar Irrigation and Watershed Management Project). Benefits from sediment load removal amount to US$141,000 per year and present value is about US$350,000.

Global Public Benefits

19. To the value of wood produced by forest, the value of ecosystem services provided by the forest was added. A recent meta-analysis of the value of forest ecosystem services[24] suggests that on average, forests in Burundi provide US$44.9 per ha per year in all ecosystem services (excluding the value of wood production), to which contribute hunting and fishing (US$29.4 per ha) and non-wood forest products (US$15.5 per ha). The total benefits provided by reforestation is then US$5.1 million (present value, including the value of wood production).

Other Benefits and Costs Not Quantified

20. The benefits estimated in this analysis represent an underestimation because some other benefits are not included. The following lists examples of benefits that have not been quantified.

- **Air pollution.** Indoor air pollution will likely be reduced due to improved stoves introduced to households, which will improve the health of household members.
- **Water harvesting.** The activity will result in additional benefits through strengthening of soil structure and reduction of drought-related yield loss.
- **Land certification.** Additional benefits are expected from this activity, including (a) improved behavior/practices due to secured asset holding, (b) production without disruption due to reduced conflict between landowners, and (c) increased success of activities of Subcomponent 2.1.
- **Capacity.** The improved knowledge and capacity of farmers will be an asset that can catalyze replication of results in non-project areas.
- **Improved park quality.** Ecotourism promotion activities under Component 3 will likely increase the quality of the national parks and nature reserves, which may increase the state revenue through park entrance fees.
- **Increased value of livestock production.** Because of the lack of data, the values are not included.
- **Flood reduction.** By strengthening the soil integrity upstream as well as by reducing sedimentation and land erosion, the project will contribute to reduced landslides and floods in the project areas. Because of the lack of information regarding the contribution of project activities to the reduction of flood, the potentially reduced costs of damage of flood, such as value of lost lives, are not included in the analysis. The CoED report mentions a flood cost of US$3.3 million per year in Burundi.

[24] Siikamäki, Juha, Francisco J. Santiago-Ávila, and Peter Vail. 2015."Global Assessment of Non-Wood Forest Ecosystem Services: Spatially Explicit Meta-Analysis and Benefit Transfer to Improve the World Bank's Forest Wealth Database." Resources for the Future (final draft).

- **Carbon sequestration.** The project is expected to contribute to increased carbon sequestration through reforestation and improved agricultural practices. This value will be estimated using a tool called Ex-Act, at which time it will be incorporated in the analysis.

- **Other costs.** Costs that may be incurred after the completion of the project to maintain the terrace structure, agricultural land soil fertility, and administrative and other expenses are not included.

Results

21. The overall economic analysis of the BLRRP shows strong economic profitability. From the economic analysis, the NPV is US$5.5 million (using 20 percent discount rate and 20-year benefit stream) and the ERR is 26 percent. The lion's share of benefits comes from on-site private benefits (within the project area coming from direct income increase, avoidance of yield or income loss that would occur without project, and flood risk reduction) (see table 4.3).

Table 4.3. Summary Results of Economic Analysis

Actualized values (discount rate: 20% over 20 years)				
Costs	**Benefits**	**NPV**	**IRR**	**B/C ratio**
17,493,620	22,971,534	5,477,914	26%	1.31

Note: IRR = Internal rate of return.

ANNEX 5: POLICIES AND STRATEGIES THAT ARE RELATED TO FOREST AND LANDSCAPE RESTORATION IN BURUNDI

COUNTRY: Burundi

Burundi Landscape Restoration Project

1. Forest and landscapes restoration practices are recognized in various international processes such as the United Nations Framework Convention on Climate Change, United Nations Framework Convention to Combat Desertification, Convention on Biodiversity (CBD), and Sustainable Development Goals as well as in the national sectoral policies and strategies and action plans to implement these processes. For Burundi, these policies and strategies are detailed in this annex.

2. **Vision Burundi 2025.** This is a planning instrument for ensuring long-term development which guides the policies and strategies about sustainable development, with the aim of satisfying the needs of the present generations without undermining the opportunities of future generations.

3. **National Policy on Climate Change (November 2013).** The overall objective of this policy is to promote climate change resilience development through (a) providing a framework for integrating climate change considerations into the various sectoral policies and development planning at all levels; (b) strengthening the legal and institutional framework for effective coordination and implementation of adaptation and mitigation actions; (c) promoting the adoption of technologies and approaches that improve resilience to climate change; (d) promoting and supporting incentives and other economic instruments that promote investment in low-carbon development; and (e) strengthening adaptive capacity and improving collaboration, cooperation, synergy, partnership, and participation in the development and implementation of adaptation and mitigation actions by all stakeholders.

4. **Burundi National Forest Policy (March 2012).** The Forestry Policy sets out broad guidelines for reversing the degradation of forest resources. The main strategies to implement this policy include (a) promoting agroforestry reforestation, (b) adapting silviculture to the needs of the population, (c) decentralizing forest management, (d) promoting forestry research and domestication of tree species, and (e) enabling reduction at all stages of the chain of losses due to organizational gap and unsustainable techniques.

5. **Environment code.** This code sets the fundamental rules for managing the environment and protecting it against any form of degradation to safeguard and enhance rational exploitation of natural resources. Concerning the fight against soil degradation, Article 29 states that “the conservation of soils against erosion is a national and individual ecological duty.” The code provides specific soil protection measures to combat desertification, erosion, loss of arable land and pollution, by chemicals, pesticides, and fertilizers.

6. **National Environment Strategy (*Stratégie Nationale pour l’Environnement au Burundi* - SNEB).** This strategy is built around the main axis such as coordinated environmental management, land and water management, agriculture, livestock and forestry, trade, human settlements and health, natural and cultural heritage and tourism, and research and communication.

7. **National Action Plan for Adaptation to Climate Change (March 2013).** The National Action Plan for Adaptation to Climate Change (NAPA) is built around 14 priority options, 11 of which have direct influence in the conservation of the land resources:

- Preserve existing woodlands and reforest naked areas
- Strengthen the management of existing PAs and establish PAs as natural ecosystems identified as threatened and vulnerable
- Extend rainwater harvesting techniques for agricultural or household use
- Establish devices to control erosion in sensitive areas
- Establish and protect strategic buffer zones in the floodplain of Lake Tanganyika and around the Bugesera Lakes
- Identify and popularize drought-resistant forest tree species
- Extend short-lived and drought-resistant crops
- Extend permanent stocking techniques
- Identify and popularize improved wood utilization techniques and renewable energies
- Monitor dynamics of rivers and streams in the Mumirwa, including the city of Bujumbura
- Train and inform decision makers and other stakeholders, including local communities, on how to adapt to climate variability

8. **National Strategy and Action Plan on Biological Diversity (2013–2020).** This strategy is built around the following themes: biodiversity conservation, sustainable use of biological resources, equitable sharing of responsibilities and benefits in managing biodiversity, promotion of biotechnology, education and public awareness, training and research, promotion of impact studies and reduction of adverse effects, and enhanced cooperation and information exchange.

9. **National Strategy and Action Plan to Combat Soil Degradation (2011–2016).** The National Strategy and Action Plan to Combat Soil Degradation constitutes an instrument for integrating all actions to be implemented to improve soil conservation. It serves as a framework for operationalizing the Burundi political will that is expressed in the Poverty Reduction Strategy Paper (PRSP) II to fight against soil degradation. This policy document also implements the United Nations Convention to Combat Desertification, which Burundi ratified in 1997.

10. **Strategic Framework for Growth and Poverty Reduction (*Cadre Stratégique de Croissance et de Lutte contre la Pauvreté*) CSLP II (January 2012).** The PRSP documents the Government's environmental strategy, which makes it possible to consolidate the necessary link between the protection of the environment and development. This strategy is built around the following themes: Strengthening of the

State of Law, Consolidation of Good Governance, and Promotion of Gender Equality; Transformation of the Burundian Economy for Sustained and Creative Growth of Jobs; Improvement of Accessibility and Quality of Basic Services and Strengthening of National Solidarity; and Space and Environment Management for Sustainable Development. As part of the fight against land degradation, the PRSP advocates the Government's commitment to land reform to secure small farms and to permanently fix populations on their farm.

11. **National Agricultural Strategy (NAS) (2016–2025).** This strategy calls for integrated agricultural-forestry-zoological techniques in the affected areas, restoration of lands, and enhancement and preservation of their fertility. Its objective is to sustainably contribute to increased agricultural production, responsible management of natural resources, resilience to climate change, and human well-being.

12. **National Agricultural Investment Plan (NAIP) 2012–2017.** The NAIP is a framework for coherence and coordination of investment in the agricultural sector. Its objectives are to ensure food security for all, increase household incomes, provide foreign exchange, supply material for the industrial sector, and create jobs in the processing and agricultural services sector. The NAIP aims to operationalize the NAS and the PRSP. It is in line with the commitments made by the Government under Comprehensive Africa Agricultural Development Programme (CAADP). The Government intends to transform the current threat of food insecurity into an opportunity for the in-depth conversion of Burundian agriculture, which should satisfy national needs and become a net exporter of food.

13. **NAPA (January 2007).** The objective of the climate change strategy is to build Burundi's capacity and resilience to meet the challenges of climate change.

14. **National Strategy for the Prevention of Risks and Disaster Management and National Action Plan (2012–2015).** This strategy constitutes an important starting point for integrating risks and disasters into sectoral planning for sustainable development in an environmentally sound environment for Burundi. It expresses the Burundi political will in the prevention and management of risks and disasters.

15. **Burundi NDC.** In the framework of its Intended NDC, 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.

16. **National Communication Strategy on Adaptation to Climate Change and Early Warning of Extreme Climate Forecasts (2014–2018).** The main objective of the strategy is to improve communication and awareness on climate change and early warning of extreme climatic events to increase Burundian society's capacity to adapt to climate change. It focuses primarily on the various national and decentralized institutions responsible for planning and implementing specific measures for climate change awareness-raising and the development of a viable and effective early warning. Second, it is addressed to all other actors involved in adaptation and early warning, such as various donors, academic staff, NGOs, and civil society.

17. **Provincial Land Management Strategies (*Schéma Provincial d'Aménagement du Territoire,* SPATs).** The overall objectives of SPATs are to increase the visibility of sectoral policies by providing territorial coherence framework at the national and provincial levels; better identify and locate investment programs in areas where they will have the greatest impact; better adjust rural development

policies in the territory of the provinces by identifying spaces for vocation; and identify the structuring elements that could positively transform the image of the territory of the provinces from an economic, social, and environmental point of view. So far, these documents have been developed for 12 out of 18 provinces. Unfortunately, they have not yet been implemented nor largely shared with relevant ministries and local experts. It is important to note that out of six provinces concerned by the project, only four (Bubanza, Cankuzo, Muyinga, and Ruyigi) have SPAT. According to the MEEATU, Kayanza and Bujumbura Rural have not developed their SPAT documents because of financial constraints.

18. **Burundi commitment to Bonn Challenge.** The Bonn Challenge is a global effort to bring 150 million ha of the world's deforested and degraded land into restoration by 2020 and 350 million ha by 2030. Underlying the Bonn Challenge is the FLR approach, which aims to restore ecological integrity at the same time as improving human well-being through multifunctional landscapes. To contribute to this challenge, Burundi committed to restore 2 million ha of degraded and deforested lands.

ANNEX 6: GENDER MAINSTREAMING

COUNTRY: Burundi
Burundi Landscape Restoration Project

1. Women constitute 51 percent of the Burundian population, and more than half of the population is made up of young people under 17 years and the fertility rate is 6.4 children. Women's situation in Burundi shows that over 92 percent of women have agriculture as their main occupation, compared to 75 percent of men, and less than 4 percent have a wage job in the nonfarm sector. Most of these women are illiterate. Even within agriculture, women are overrepresented in the less desirable occupations: two-thirds of women have their main job in unpaid family farming, compared to 9 percent of men. Women are less likely than men to be independent farmers. Besides, women have limited access to appropriate production, inputs (quality seed, fertilizer, and so on), credit, low level of technical knowledge and conservation technologies, and little control of the agricultural income they generate.[25]

2. The feminization of agriculture in the country does not go hand in hand with the feminization of land tenure. There is no national inheritance code and in the absence of national texts, it is local customary rules based on a patriarchal regime that govern family land and women's access to and inheritance of land. On the family lands, this regime recognizes the woman as a usufructuary but not as an heir.[26] Most of the poor are small farmers (with less than 0.5 ha) who depend on food crops, a situation that applies particularly to women farmers who are household heads. These vulnerable households have neither sufficient space nor financial resources to try growing cash crops, and thus, they give priority to subsistence crops, which are traditionally cultivated by women.

3. Nearly 70 percent of the population lives below the poverty threshold (with less than a dollar a day per inhabitant). Rural inhabitants are the most severely affected by poverty and food insecurity.[27] More than 3.6 million people face food insecurity, and chronic malnutrition affects 58 percent of children under the age of 5 in Burundi.[28] The Global Food Security Index, which ranked 113 countries based on the core issues of affordability, availability, and quality, placed Burundi at the bottom.[29] Households with large numbers of children, members with or without disabilities, female heads of households/widows are more likely to fall into poverty. Women in Burundi are often primarily responsible for meeting the family food needs but they are also responsible for water and energy needs of households. These last two activities cause women and children to spend several hours searching for water and firewood. Thus, women and children tend to be more vulnerable to the effects of lack of food or water and to succumb in greater proportion to natural hazards.[30]

4. The Constitution establishes 30 percent of political positions for women; the National Gender Policy and the electoral laws facilitate the promotion of the participation of women on communal councils. However, the level of political and economic participation of women remains very low. Their

[25] http://documents.worldbank.org/curated/en/533871484310834777/Évaluation-de-la-pauvreté-au-Burundi.
[26] https://www.ifad.org/documents/10180/fd7893b4-7887-4a63-b052-5063f6fd5800.
[27] https://www.gafspfund.org/sites/gafspfund.org/files/Documents/2-Burundi%20GAFSP%20Proposal.pdf.
[28] http://www.fao.org/fileadmin/user_upload/emergencies/docs/FAOBurundi_sitrep_5May2016.pdf.
[29] http://foodsecurityindex.eiu.com/Country/Details#Burundi.
[30] http://documents.worldbank.org/curated/en/533871484310834777/Évaluation-de-la-pauvreté-au-Burundi.

limited representation is partly related to the imbalances noted at the levels of the education system. It is estimated that women occupy only 20 percent of the total number of positions of responsibility in the Central Government. At the level of the provincial and communal government, women account for only 18 percent of posts of governors and 12 percent of posts of communal administrators.[31] However, only 17 percent of *colline* board members are women, and only 136, or 5 percent, of the 2,615 heads of *collines* are women.

5. Gender inequality remains one of the most pervasive forms of discrimination. A gender mainstreaming strategy for the project will be developed during early implementation so that the project actions will identify those gaps and biases to be addressed to avoid exacerbating or reinforcing gender inequalities. According to the gender gaps identified in the country, the strategy could have four lines of actions: (a) to develop institutional capacity building on the links of gender and landscape restoration activities at the national and local level, (b) to promote the participation and leadership of women and their organizations in actions related to landscape restoration, (c) to promote knowledge exchange and communication in relation to the application of the gender and equity approach, and (d) to institutionalize the gender approach in the management of the program.

6. At the same time, the project will promote actions that proactively improve the situation of whole communities through an inclusive, equitable, and participatory approach. The proposed project will address the gender discrepancies regarding the nature and status of employment in the agricultural sector by facilitating women access to the community labor-intensive activities. It will contribute to support women's land rights by facilitating land certification for women. The project's interventions aim to enhance equitable access, especially as a way of diversifying livelihoods in a climate-resilient manner. Some of the gender-focused activities will include gender assessments to ensure women- and men-differentiated needs, interests, and contributions are considered. Further facilitating women's participation in formal and informal decision-making structures, platforms, and governance processes related to ecosystem-based adaptation will allow their voices to be heard and obtain equitable access to project benefits. Full and active women's participation in the implementation of the project will require the development of their capacities. For instance, this can be done through FFSs or training.

7. The project will ensure mainstreaming gender and support representation of a gender focal person on the technical task force. Within the multi-sectoral context of the project approach, the project will invite the participation of a gender or community development Government representative(s), possibly from the Ministry of National Solidarity, Human Rights, and Gender or the Ministry of Planning and Community Development and women organizations involved in agriculture, land rights, or forestry to the task force to inform their inputs into the project design.

8. During early implementation, the project will fund gender analysis to provide a baseline on the roles, responsibilities, uses, rights, and practices that affect the way women and men from the various socioeconomic/cultural groups in the target area use and manage natural resources to support their livelihoods and their families (sex disaggregated). The analysis should provide inputs to address gender gaps in the project areas. A gender strategy with budget provision will guide mainstreaming gender into project implementation.

[31] http://www.bi.undp.org/content/dam/burundi/docs/publications/UNDP-bi-vision-burundi-2025_complete_EN.pdf.

ANNEX 7: ROAM ANALYSIS FOR DEGRADATION, RESILIENCE, FOOD SECURITY, AND BIODIVERSITY

COUNTRY: Burundi
Burundi Landscape Restoration Project

Source: IUCN, 2017

Restoration Opportunities Assessment Methodology

Multicriteria Spatial Analysis of FLR

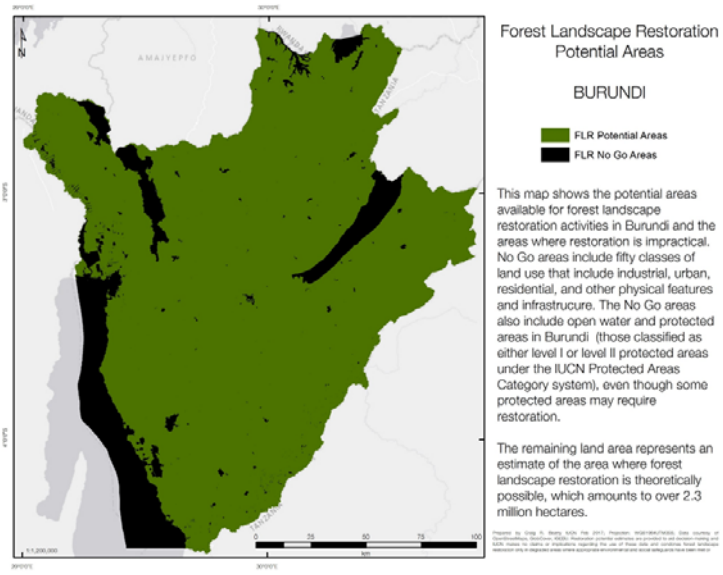
1. The objective for carrying out an FLR assessment in Burundi is to identify and prioritize the opportunities areas for restoring degraded and deforested land, to combat soil erosion, increase soil productivity, preserve and restore biodiversity, tackle rural poverty, generate lasting social, economic, and environmental returns, to decrease siltation of the marshes and enhance climate resilience.

2. Areas of specific interest to be identified are those with (a) most degraded land and high levels of soil erosion; (b) higher incidence of poverty; (c) greatest risk of floods and landslides and its impacts on the vulnerable poor; (d) greatest potential to protect downstream infrastructure (roads, houses, power and water supplies,); and (e) proximity to PAs. To achieve this, the project team carried out an MCA, using the methodology described in the following paragraphs.

3. The MCA uses a series of input data to help define the priority areas for FLR and assesses degradation, resilience, food security, and biodiversity. The analysis demonstrates where FLR might address drivers of degradation in Burundi and where FLR can be prioritized for improved food security, resilience, and biodiversity. The analysis concludes by interpreting these thematic priorities regarding the underlying level of degradation.

4. The components of degradation in Burundi include soil erosion, reduced agricultural productivity, siltation of wetlands and hydropower sources, climate change, loss of biodiversity and ecosystem services, rural poverty, and lack of income-generating activities. While there are many possible proxies for degradation in Burundi, available spatial data dictates which proxies for degradation can be used in a spatial analysis. This analysis focuses on eight proxies for degradation, outlined in the following tables.

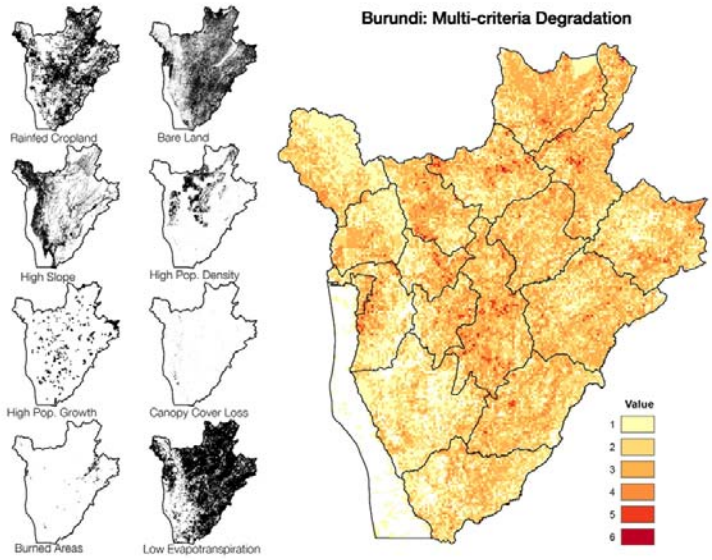
Figure 7.1. Restoration Potential Map



Source: IUCN (2017)

5. This map shows the areas within Burundi where there is a theoretical possibility of FLR. It excludes open water, physical infrastructure, and gazetted national parks. While restoration may still be possible in these areas (especially national parks), the broad area within Burundi that is open for typical FLR interventions is captured in this map.

Figure 7.2. Multicriteria Degradation Map



Source: IUCN (2017)

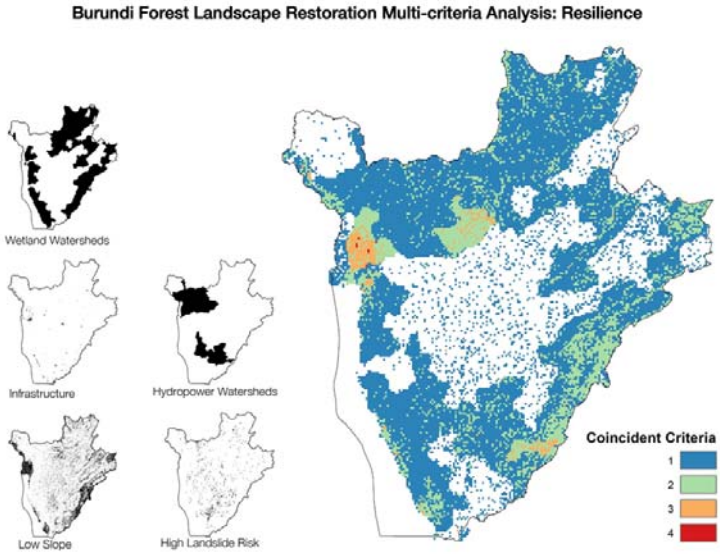
6. This map demonstrates the severity of degradation in Burundi based on the coincident overlap of parameterized input criteria. Criteria were selected as available proxies for degradation in Burundi. Where

six of the eight input criteria overlap, the color is darkest red. There were no areas where seven or eight degradation proxies overlapped with one another.

Table 7.1. Degradation Proxy and Parameters

Degradation Proxy	Data Source	Parameters for MCA
Canopy cover loss	Hansen/University of Maryland Earthengine partners	2000–2014 Canopy cover loss
Areas of high slope	NASA Shuttle Radar Topography Mission - SRTM30m	Percent slope greater than 24%
Bare land	NASA Landsat	All non-zero values
Recently burned areas	MODIS MCD64A1 2017	burned areas (January 1, 2016 – January 1, 2017)
Low actual evapotranspiration	Nile Basin Initiative	AET <400 mm/year
Rainfed Cropland	NASA Global Food Security	Rainfed Cropland
Population Pressure	WorldPop 2010, 2015	Change in population per *colline* of 5,000 or greater between 2010 and 2015
Population Density	WorldPop 2015	>400 people per km^2

Figure 7.3. Multicriteria Map: Resilience



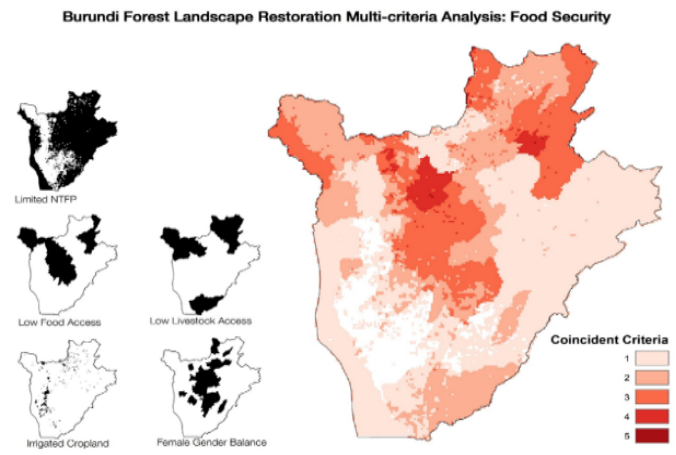
Source: IUCN (2017)

7. This map demonstrates the priority areas where FLR interventions could address resilience in Burundi based on the coincident overlap of parameterized resilience proxies. Criteria were selected as available proxies for resilience in Burundi, especially due to flooding and siltation of wetlands and important watercourses. Where four of the five input criteria overlap, the color is red. There were no areas where all five resilience proxies overlapped with one another.

Table 7.2. Resilience Proxy and Parameters

Proxy	Data Source	Parameters for MCA
Wetlands	USGS Africa Ecosystems and HydroSHEDS 11.	Watersheds that contain wetland ecosystems
Hydropower supply	FAO Aquastat/SRTM30m digital elevation model/HydroSHEDS11	Watersheds that supply hydropower dam locations
Landslide risk	High slope %, high precipitation, bare earth %	Results classified into 5 equal classes, top 3 classes (moderate, high, very high) selected for MCA
Hard infrastructure	Open Street Map	Industrial, civil and residential areas and structures
Lowlands	SRTM30m, % slope	Areas <6% slope

Figure 7.4. MCA: Food Security



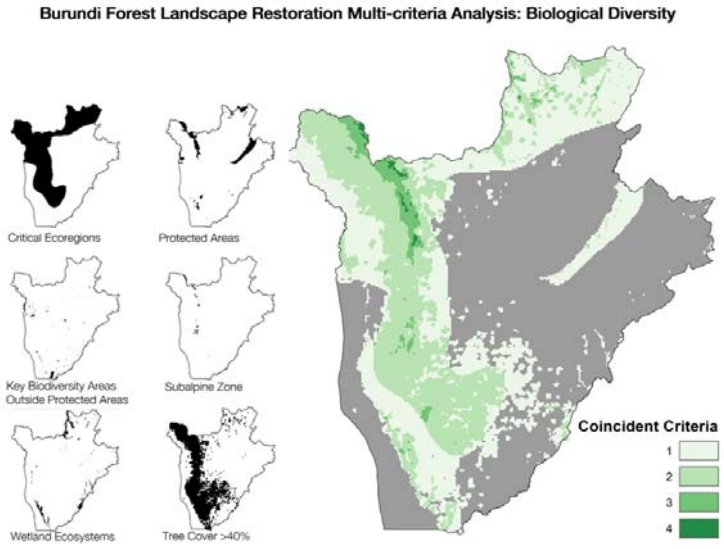
Source: IUCN (2017)

8. This map demonstrates the priority areas where FLR interventions could address food security in Burundi based on the coincident overlap of parameterized food security proxies. Criteria were selected as available proxies for food security in Burundi, especially due to access and availability. Also included are areas where the gender balance is slightly skewed toward women. Because women play a disproportionate role in the production and harvest of food in Burundi, the inclusion of these areas provides an essential component of the analysis that lends priority to interventions where they may disproportionately benefit women. Where all five of the input criteria overlap, the color is darkest red.

Table 7.3. Food Security Proxy and Parameters

Proxy	Data Source	Parameters for MCA
Limited access to non-timber forest products	Global Land Cover Facility, University of Maryland	Areas beyond 1 km from tree cover >40%
Access to livestock	Burundi Census, 2008	6 provinces with the fewest livestock per household
Access to food	Burundi Census, 2008	6 provinces with the lowest metric tons of food per capita
Female gender balance	Burundi Census, 2008	Female population by commune >0.50 standard deviations above mean gender proportion
Irrigated cropland	NASA Global Food Security	Areas of crop irrigation

Figure 7.5. Multicriteria Map: Biological Diversity



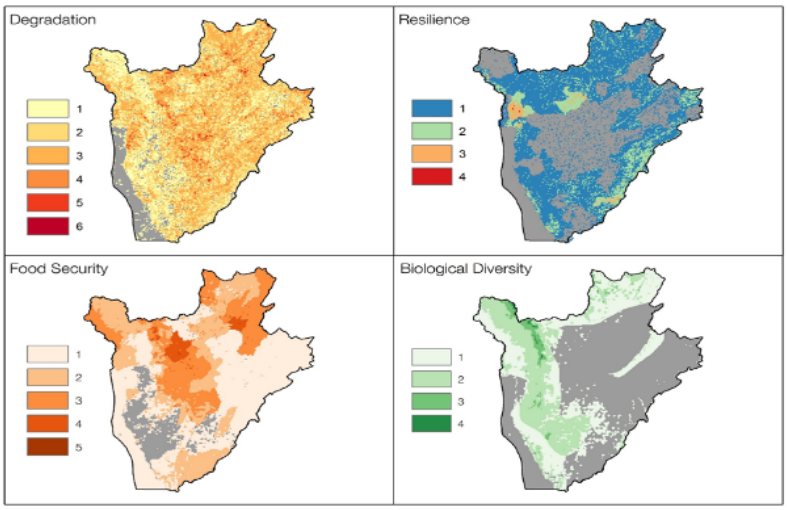
Source: IUCN (2017)

9. This map demonstrates the priority areas where FLR interventions could address biological diversity in Burundi based on the coincident overlap of parameterized biodiversity proxies. Criteria were selected as available proxies for biodiversity in Burundi, especially due to the existence of key biodiversity areas (KBAs) for biodiversity (as defined by the IUCN KBAs Partnership) and areas important for biodiversity referenced in Burundi's National Biodiversity Strategy and Action Plan. The KBAs were included here outside of PAs as many areas key for biodiversity in Burundi already exist within PAs.

Table 7.4. Biological Diversity Proxy and Parameters

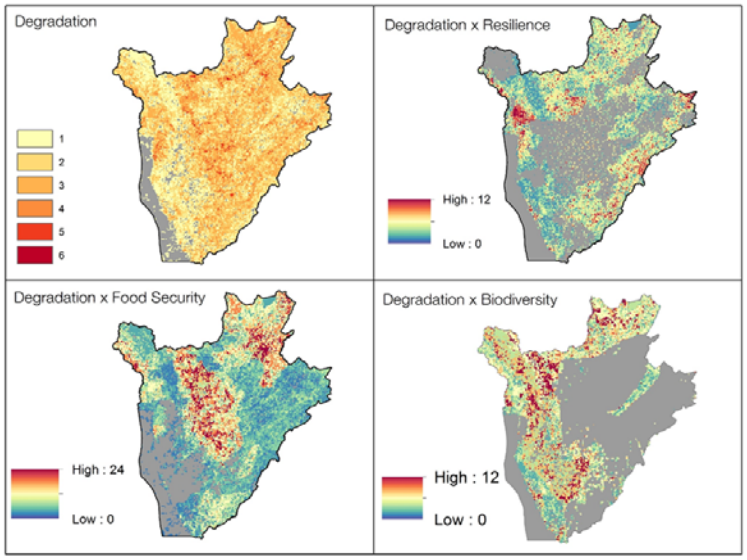
Proxy	Data Source	Parameters for MCA
KBAs	IUCN/Birdlife International	KBAs outside PAs
PAs	World Database on PAs United Nations Environment Programme/IUCN/WCMC	PAs
Tree Cover	Global Land Cover Facility, University of Maryland	Areas of greater than 40% tree cover with 1 km buffer
Ecoregions	WWF, Global Ecoregions	Threatened ecoregions
High altitude ecosystems	Shuttle Radar Topography Mission (SRTM) 30 m Digital Elevation Model	Areas above 2,450 m (subalpine zone)
Ecosystems	USGS Ecosystems of Africa	Wetland ecosystems

Figure 7.6. Scenario-based MCA



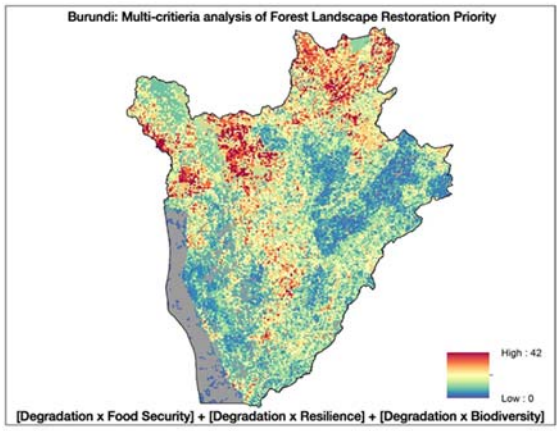
10. The multicriteria maps in figure 7.6 show a combination of landscape degradation and MCA results associated with three thematic scenarios for restoration (resilience, food security, and biological diversity). Legends in the map refer to the spatial coincidence of input criteria, demonstrating severity of degradation or priority areas for where FLR interventions could have greater benefits for each scenario.

Figure 7.7. Restoration Priority Map



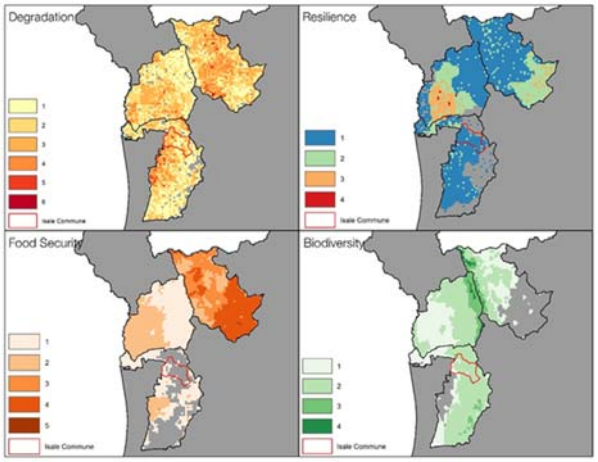
11. Figure 7.7 demonstrates the product of the multicriteria degradation map and each of the three FLR scenarios described earlier. This process provides an index for each of the scenarios where the coincidence of the highest priority areas and the most severely degraded areas will produce the highest values. These are versions of each of the three scenarios that are indexed to the severity of landscape degradation (scenario x degradation map).

Figure 7.8. Opportunity Map



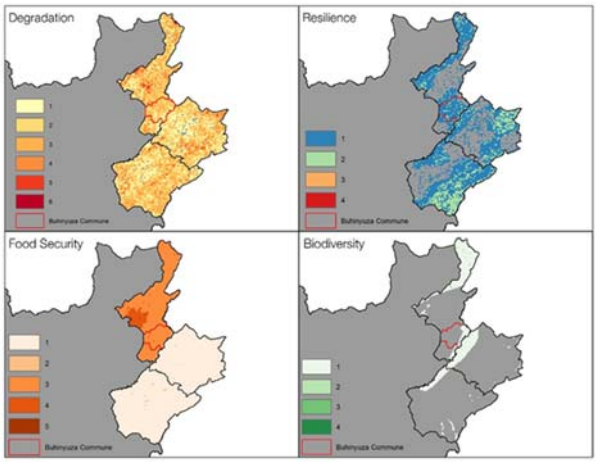
12. Figure 7.8 shows the sum of all the restoration priority maps for the combined and degradation-indexed maps earlier. This map represents a reasonable approximation of the areas in Burundi that are of the highest priority for FLR based on the sum of all the scenario input criteria and their relationship to landscape degradation.

Figure 7.9. Targeted Regions (Northwest)



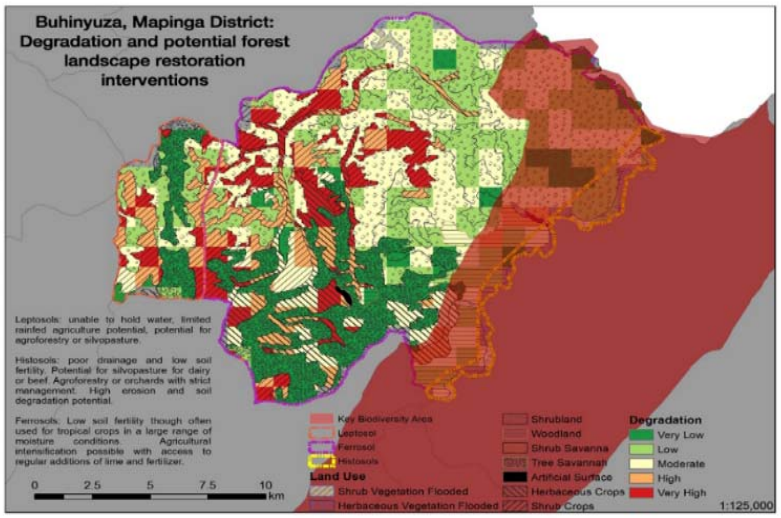
13. **The northwest region (Bubanza, Kayanza, and Bujumbura Rural Provinces)** is characterized by steep terrain, fragile soils, high demographic pressure (around 400 inhabitants/km^2), and overexploitation of the land from crop and livestock farming. The region is extremely vulnerable to rain-induced soil erosion. Figure 7.9 shows the projected degradation and scenario priority that are the result of the MCA mentioned earlier. Isale is a focal commune that will be described below.

Figure 7.10. Targeted Regions (East)



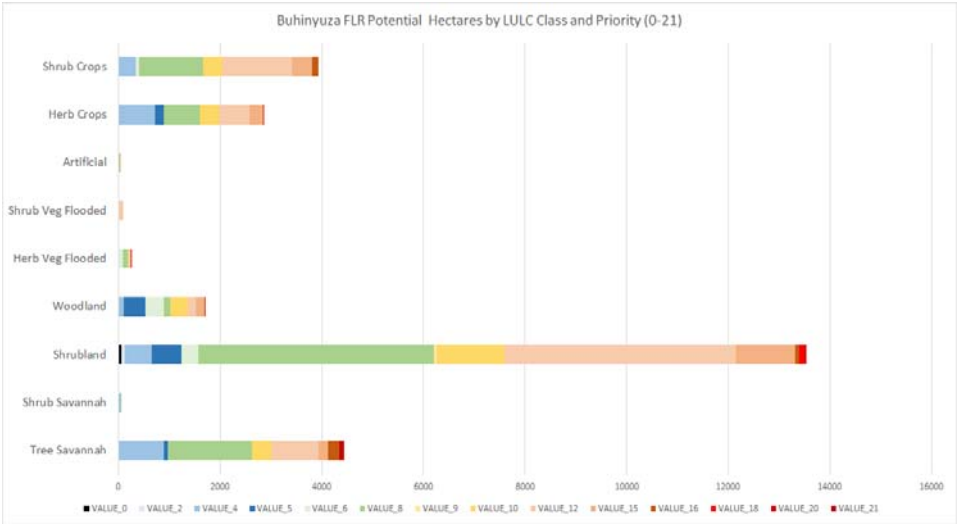
14. **The eastern region (Conkuzo, Ruyigi and Muyinga Provinces)** has some of the highest poverty rates and is often cited as among the most environmentally degraded areas in the country. Figure 7.10 shows the projected degradation and scenario priority that are the result of the MCA mentioned earlier. Buhinyuza is a focal commune that will be described in the next paragraph.

Figure 7.11. Degradation and potential forest landscape restoration interventions



15. Figure 7.11 shows the Buhinyuza commune. Underlying the boundaries of the commune is a land use land cover layer that has been aligned with the restoration priority map for Burundi. Areas of dark red indicate a high level of projected degradation and the land use of this degraded area. Additionally, the map includes three soil areas, outlined from left to right. Each of these soil types has properties that help direct FLR intervention planning. For instance, in the west of the commune, the area is dominated by leptosols, which are characterized by their inability to hold water and the limited potential of this soil type to support rainfed agriculture. Within this region, it can be seen that there are several areas of degraded shrub crops. Additionally, underlying data in the MCA indicate that these areas are also high-slope areas. The FLR interventions in this area could focus on progressive terraces with a focus on transitioning to agroforestry or silvo-pasture systems. This area is also within 10 km of a KBA and FLR interventions that contain some native species component could support biodiversity in this area.

Figure 7.12. Buhinyuza FLR Potential



16. Figure 7.12 shows the total hectares available for FLR in each land-use land-cover class in Buhinyuza commune and the priority of those hectares based on the FLR priority map (Figure 7.7). Values to the right on each of the bars indicate hectares that are of greater projected priority than values within each bar on the left. This chart shows that shrubland has the most potential area for FLR in the commune and the highest number of high priority hectares.

Assessment Analysis should Focus on where FLR Need to be Prioritized

17. The MCA helps identify interventions that will boost the potential of landscapes to lift people out of poverty and generate lasting social, economic, and environmental benefits.

18. FLR interventions need to take into consideration, among others,

- Gender analysis and specific FLR intervention that address the distinct needs of women and girls and close the gender gaps;
- Poverty, as those in extreme poverty and not able to absorb shocks, will require different interventions focusing on diversification of livelihoods (mostly rural, small-scale farmers) and with low cost;
- The specific interests and needs of small scale households and farmers, building business models based on those needs and market value/access;
- Rain-fed and irrigated areas that will require different interventions as will soil types and vulnerabilities to erosion and tillage. Slope and vulnerability to flash floods need to be integrated into the FLR interventions that develop the adaptive capacity of Burundi; and
- Areas with low soil fertility that will need soil building to increase productivity.

FLR Options

19. **Eastern region (Muyinga, Cankuzo and Ruyigi).** This region is predominantly characterized by gentle slopes, relatively low population density, poverty, and low risk of landslides.

- Progressive contour terracing with grasses and tree planting along contours. The distance between contours must be kept short to ensure that terraces are formed after few years
- Agroforestry mainly using fruit trees for food production and revenue generation (species should be selected with participation of local communities)
- Woodlots
- Forest rehabilitation
- Soil fertilization

- Buffer to protect Ruvubu National Park and human population against damages caused by wild animals

20. **Western region (Bubanza, Kayanza and Bujumbura Rural).** This region is predominantly characterized by steep slopes with high risk of landslides, fragile soils, high rate of erosion and gullies, and rivers siltation, downhill floods associated to bad agricultural practices, and land degradation in the catchment areas. It is also characterized by high density of population (small size of household farms) and poverty. The FLR options should focus on catchment approach using a combination of the following practices, depending on the characteristic of the site concerned:

- Agroforestry mainly using fruit trees for food production and revenue generation (species should be selected with participation of local communities).
- Progressive terracing with grasses and tree planting along contours.
- Afforestation and forest rehabilitation.
- Restoration of mining sites (trees and shrub plantations, and so on).
- Plantation of bamboos along gullies and rivers to consolidate their banks.
- Agroforestry focusing on increasing land cover and involving a multi-storied system (for instance a mixture of oil palm trees, banana, fruit trees, and food crops). This practice is already existing in some communes of Bujumbura Rural, such as Isale and Mubumbi and can be extended to similar sites.
- Rainwater collection, storage and use, especially during the dry season.
- Tree plantation along the roads.
- Soil bioengineering using living materials, that is, seeds, plants, part of plants, and employing them for embankment stabilization and erosion control of unstable and/or eroding sites such banks of gullies and rivers). This must be envisaged in Bujumbura because of its topography and soil characteristics.
- Restoration within relevant parts of Kibira National Park.

21. The MCA is used to provide the information needed to design the technical packages.

ANNEX 8: ISALE AND BUHINYUZA SLOPE AND SOIL ANALYSIS FOR TERRACES SITING

COUNTRY: Burundi
Burundi Landscape Restoration Project

Introduction

1. The present technical brief provides details about the topographic slope and soil analysis of two communes of the country, which will represent the pilot areas of the project: the commune of Buhinyuza (Muyinga Province) and the commune of Isale (Bujumbura Rural Province). The slope analysis is based on the Shuttle Radar Topography Mission database (NASA) and it is realized with a resolution of the Digital Elevation Model grid of 1 arcsec–30 m. The soil database has been collected by the ISABU offices in Bujumbura.

Methodology

2. The slope maps of the selected communes have been realized in a geographic information system (GIS) software (QGIS) and the extension of the areas characterized by a certain value of slope have been isolated and measured, to evaluate the area to be potentially restored with progressive terraces, radical terraces, or reforestation, without considering soil information.

3. After that, a more detailed analysis was realized, reducing the area suitable for radical terraces, excluding the soils with a thickness below 100 cm, with 120 cm being the optimal soil depth for radical terrace implementation (World Overview of Conservation Approaches and Technologies, 2014).

Results

Isale			
Slope (%)	**Surface**		**Soil Conservation**
	ha	**%**	
0–2	43.2	0.40	
2–6	208.6	1.93	
6–25	3,462.9	32.06	Progressive terraces
25–45	3,941.6	36.49	Radical terraces
45–55	1,249.5	11.57	Reforestation - Radical terraces
>55	1,897.2	17.56	Reforestation
Total	10,803.1	100.00	

Buhinyuza			
Slope (%)	**Surface**		**Soil Conservation**
	ha	**%**	
0–2	872.8	3.12	
2–6	4,266.8	15.25	
6–25	19,514.3	69.76	Progressive terraces

Buhinyuza			
Slope (%)	Surface		Soil Conservation
	ha	%	
25–45	3,059.9	10.94	Radical terraces
45–55	199.6	0.71	Reforestation - Radical terraces
>55	59.3	0.21	Reforestation
Total	27,972.6	100.00	

Isale - soils with thickness >100 cm			
Slope (%)	Surface		Soil Conservation
	ha	%	
0–2	24.6	0.38	
2–6	124.0	1.93	
6–25	2,073.8	32.22	Progressive terraces
25–45	2,330.6	36.21	Radical terraces
45–55	734.0	11.40	Reforestation - Radical terraces
>55	1,149.9	17.86	Reforestation
Total	6,436.9	100.00	

Buhinyuza - soils with thickness > 100 cm			
Slope (%)	Surface		Soil Conservation
	ha	%	
0–2	705.2	3.01	
2–6	3,562.3	15.23	
6–25	16,680.8	71.32	Progressive terraces
25–45	2,299.1	9.83	Radical terraces
45–55	112.1	0.48	Reforestation - Radical terraces
>55	30.7	0.13	Reforestation
Total	23,390.1	100.00	

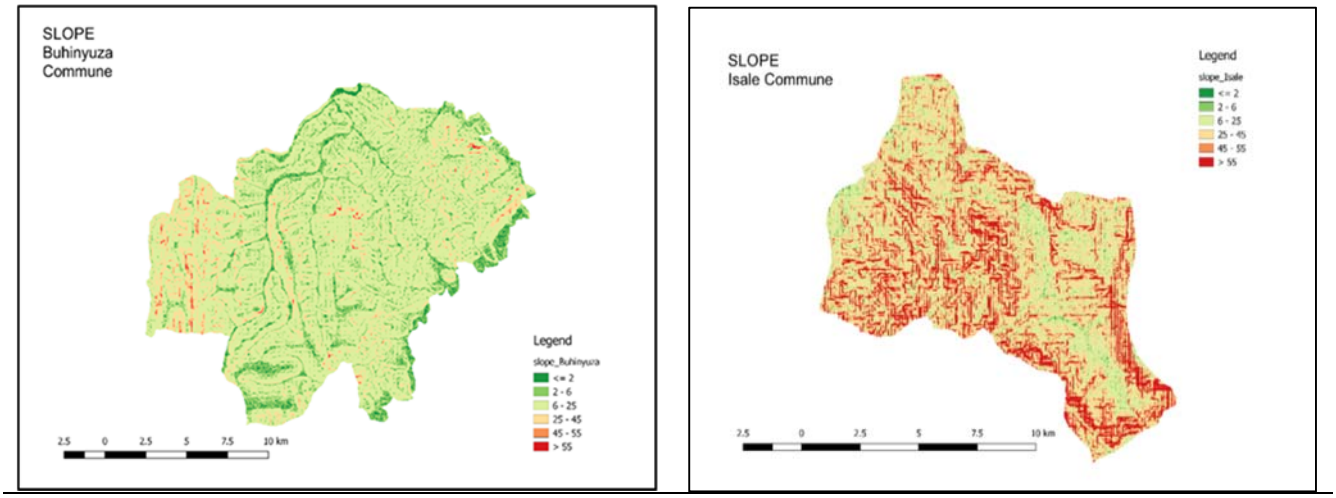
Total			
Slope (%)	Surface		Soil Conservation
	ha	%	
0–2	916.0	2.36	
2–6	4,475.4	11.54	
6–25	22,977.2	59.26	Progressive terraces
25–45	7,001.5	18.06	Radical terraces
45–55	1,449.1	3.74	Reforestation - Radical terraces
>55	1,956.5	5.05	Reforestation
Total	38,775.7	100.00	

Total - soils with thickness > 100 cm			
Slope (%)	**Surface**		**Soil Conservation**
	ha	**%**	
0–2	729.8	2.45	
2–6	3,686.3	12.36	
6–25	18,754.6	62.88	Progressive terraces
25–45	4,629.6	15.52	Radical terraces
45–55	846.1	2.84	Reforestation - Radical terraces
>55	1,180.6	3.96	Reforestation
Total	29,827.0	100.00	

Conclusions and Recommendations

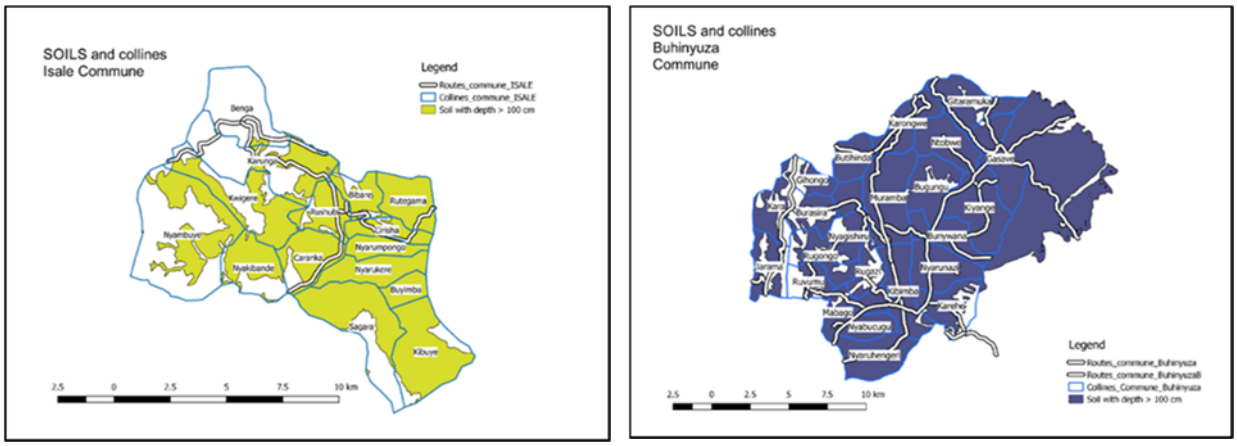
4. The reduced area for soil thickness > 100 cm can be considered also for progressive terraces, being the minimum soil depth advised by World Overview of Conservation Approaches and Technologies, 2014, around 120 cm.

Figure 8.1. Slope Maps



Source ISABU, 2017

Figure 8.2. Soil Analysis



Source ISABU, 2017

Scheme of Land Management in Hillslope Implementation

Preliminary Design Phase

(a) **Topographic survey**

- Topographic survey of the study area (planimetry and altimetry)
- Identification of main elements at the terrain level (trees, rocks, water ponding areas)

(b) **Soil and landscape analysis**

- Data collection from cartography, aerial photos, environmental maps, and geological and geomorphological maps
- Evaluation of soil profiles for rootzone depths such as
  - Analysis of soil horizons: depth, texture, color, percent of stones and rocks;
  - Soil sampling for lab analysis: texture, porosity, macro and micro elements, SAR, anion exchange, pH, fertility;
  - Definition of landscape unit: areas with same soil and landscape characteristics;
  - Possibility of modification of soil profile: levelling, drainage interventions, and so on.

(c) **Historical analysis of land management**

- Analysis of modification of land management according to the increase in agricultural mechanization to be reached, without altering surface and underground water flows

(d) **Preliminary hydraulic works design**

- Landscape and soil analysis
- Consultation of land management laws and regulation
- Land management design:
  - Terrain volume to be mobilized
  - New road planning
  - Design of surface and underground drainage
  - Agricultural assessment

(e) **Assessment of land rights reorganization**

- Coordination of hillside land management with surrounding areas, to eventually include other zones and extend land management planning
- Reduction of conflicts related to neighboring properties, drainage and water management, and road and mobility variations

(f) **Operational phase**

- Removal of existent cultivations
- Terrain levelling
- Drainage system implementation
- Bottom soil fertilization
- Soil preparation for planting
- Refinements

ANNEX 9: TECHNICAL DESIGN ON TERRACING

COUNTRY: Burundi
Burundi Landscape Restoration Project

Introduction

1. This annex covers the technical details for the implementation of terraces within the framework of the BLRRP. Two terracing types are considered for the project: progressive terraces and radical (bench) terraces.

Progressive Terraces

Figure 9.1. Progressive Terraces in Kenya

Source: World Observatory on Conservation Approaches and Technologies (WOCAT).

2. Progressive terraces are terraces which are realized through the effect of the construction of bunds along contour lines on a hillslope. The effect of soil sheet erosion, combined with the presence of bunds, creates semi-horizontal benches that can be used for cultivation (Figure 9.2).

Figure 9.2. Progressive Terraces Evolution

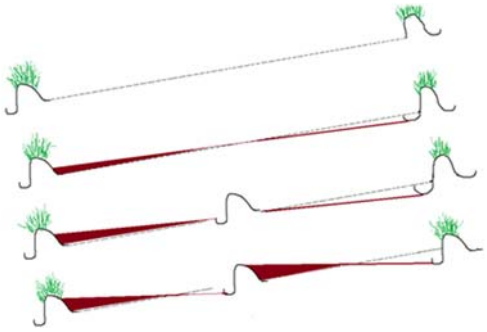
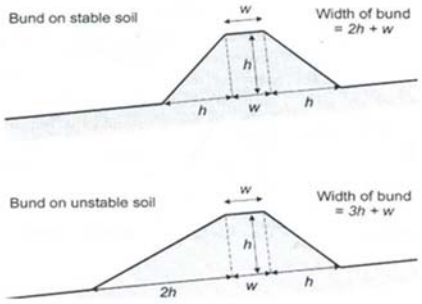


Figure 9.3. Soil Bund for Progressive Terraces



Source: WOCAT.

3. The typical range of slope for the application of progressive terraces is comprehended between 6 percent and 16 percent. Different references are available to identify the optimum distance between two bunds (table 9.1).

4. Bunds should have a height of 0.4 m (WOCAT) or 0.6 m (Rwanda checklist). The width of the bund should be 0.6 m. A schematic view of the bund construction can be seen in Figure 9.3.

5. Construction by hand takes around 90 days per hectare on a typical 15 percent slope. Usually the bunds created are stabilized with grass, often napier (*Pennisetum purpureum*), or makarikari (*Panicum coloratum* var. makarikariensis) in the drier zones.

Table 9.1. Optimal Distances for Progressive Terraces Implementation

	Burundi Guidelines[32]		Rwanda LWH Guidelines[33]		WOCAT[34]
Slope (%)	Horizontal Distances (m)	Vertical Distances (m)	Horizontal Distances (m)	Vertical Distances (m)	Vertical Distances (m)
2	30.5	0.61	50.0	1	1–1.7
4	19	0.76	25.0	1	1–1.7
6	15	0.9	16.7	1	1–1.7
8	13.5	1.08	12.5	1	1–1.7
10	12.5	1.25	10.0	1	1–1.7
12	10.5	1.26	8.3	1	1–1.7
14			7.1	1	1–1.7
16			6.3	1	1–1.7

6. In progressive terraces implementation, drainage should be considered. At the hillslope level, waterways and cutoff drainage canals should be inserted in the design to evacuate excessive rainfall. In

[32] Mekdaschi Studer, R. and Liniger, H. 2013. *Water Harvesting: Guidelines to Good Practice. Centre for Development and Environment (CDE)*, Bern; *Rainwater Harvesting Implementation Network (RAIN)*, Amsterdam; MetaMeta, Wageningen; IFAD, Rome.
[33] Illustrated Supervision Checklist for Assessment of the Quality of Comprehensive land-husbandry works at the LWH Project sites, Ministry of Agriculture and Animal Resources of Rwanda, 2011.
[34] *Comparaison de l`efficacité des terrasses radicales et terrasses progressives et leur évolution,* Cyrille Hicintuka.

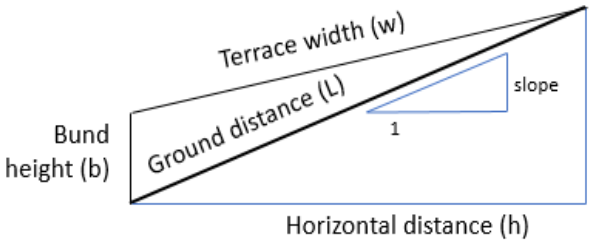
dry areas, water harvesting ponds (see annex 10) can be implemented for each terrace, to concentrate and store in the soil layer runoff water.

7. An estimation of progressive terraces soil loss is given in table 9.2.

Table 9.2. Estimation of Soil Losses for Progressive Terraces

						Stable Soils		Unstable Soils	
Slope (%)	Vertical Distance (m)	Horizontal Distance (m)	Ground Distance (m)	Bund Height (m)	Bund Width (m)	Terrace Width (m)	Soil loss (%)	Terrace Width (m)	Soil Loss (%)
2	1.0	50.0	50.0	0.6	0.4	48.4	3	47.8	4
4	1.0	25.0	25.0	0.6	0.4	23.4	6	22.8	9
6	1.0	16.7	16.7	0.6	0.4	15.1	10	14.5	13
8	1.0	12.5	12.5	0.6	0.4	10.9	13	10.3	17
10	1.0	10.0	10.0	0.6	0.4	8.5	16	7.9	22
12	1.0	8.3	8.4	0.6	0.4	6.8	19	6.2	26
14	1.0	7.1	7.2	0.6	0.4	5.6	22	5.0	30
16	1.0	6.3	6.3	0.6	0.4	4.7	25	4.1	35
18	1.0	5.6	5.6	0.6	0.4	4.1	28	3.5	39
20	1.0	5.0	5.1	0.6	0.4	3.5	31	2.9	43
2	1.7	85.0	85.0	0.6	0.4	83.4	2	82.8	3
4	1.7	42.5	42.5	0.6	0.4	40.9	4	40.3	5
6	1.7	28.3	28.4	0.6	0.4	26.8	6	26.2	8
8	1.7	21.3	21.3	0.6	0.4	19.7	7	19.1	10
10	1.7	17.0	17.1	0.6	0.4	15.5	9	14.9	13
12	1.7	14.2	14.3	0.6	0.4	12.7	11	12.1	15
14	1.7	12.1	12.3	0.6	0.4	10.7	13	10.1	18
16	1.7	10.6	10.8	0.6	0.4	9.2	14	8.6	20
18	1.7	9.4	9.6	0.6	0.4	8.1	16	7.5	22
20	1.7	8.5	8.7	0.6	0.4	7.1	18	6.5	25

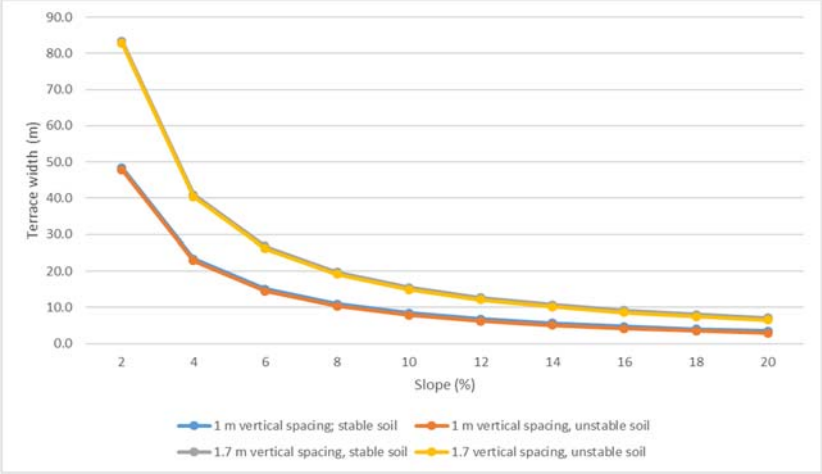
Figure 9.4. Approximated Equations for Progressive Terraces Soil Loss



Vertical spacing (v)

- $h = \frac{v}{slope}$
- $L = \sqrt{h^2 + v^2}$
- $w = \sqrt{h^2 + (v - b)^2} - bund\ width$
- bund with: see figure 3

Figure 9.5. Progressive Terraces Slope - Width Relationship



Source: G. Castelli, F. Preti, World Bank mission February 2017

Radical Terraces

8. Radical terraces are terraces implemented by ordinary earth movement, by creating reverse slope bench terraces that can be stabilized with grass. A bund (5–10 cm high and 20–30 cm wide) of soil is built all along the terrace length at the top of the embankment.

Figure 9.6. Radical Terraces Implemented in the Rwanda LWH Project

Source: G. Castelli, World Bank mission February 2017.

9. Different distances for bench terraces disposition are available. A Burundian standard,[35] with different vertical distances for each slope, is reported in Table 9.3 and Table 9.4.

[35] *Techniques pour la conservation des eaux et des sols, Gouvernement du Burundi*, FAO, Coopération italienne. September, 1996.

Table 9.3. Burundi Standard for Radical Terraces Implementation - Horizontal Distances

Terrace width (m)	Slope (%)														
	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	Slope (Degrees)														
	6.8	8.0	9.1	10.2	11.3	12.4	13.5	14.6	15.6	16.7	17.7	18.8	19.8	20.8	21.8
	Ground Distance (m)														
2.5	2.52	2.52	2.53	2.54	2.55	2.56	2.57	2.58	2.60	2.61	2.62	2.64	2.66	2.67	2.69
3.0	3.02	3.03	3.04	3.05	3.06	3.07	3.09	3.10	3.12	3.13	3.15	3.17	3.19	3.21	3.23
3.5	3.53	3.53	3.54	3.56	3.57	3.58	3.60	3.62	3.63	3.65					
4.0	4.03	4.04	4.05	4.06	4.08	4.10	4.11	4.13	4.15	4.18					
4.5	4.53	4.54	4.56	4.57	4.59	4.61	4.63	4.65	4.67	4.70					
5.0	5.04	5.05	5.06	5.08	5.10										
5.5	5.54	5.55	5.57	5.59	5.61										
6.0	6.04	6.06	6.08	6.10	6.12										

Table 9.4. Burundi Standard for Radical Terraces Implementation - Vertical Distances

Terrace width (m)	Slope (%)														
	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	Slope (Degrees)														
	6.8	8.0	9.1	10.2	11.3	12.4	13.5	14.6	15.6	16.7	17.7	18.8	19.8	20.8	21.8
	Vertical Distance (m)														
2.5	0.30	0.35	0.40	0.45	0.5	0.55	0.6	0.65	0.70	0.75	0.8	0.85	0.90	0.95	1.0
3.0	0.36	0.42	0.48	0.54	0.6	0.66	0.72	0.78	0.84	0.90	0.96	1.02	1.08	1.14	1.2
3.5	0.42	0.49	0.56	0.63	0.7	0.77	0.84	0.91	0.98	1.05					
4.0	0.48	0.56	0.64	0.72	0.8	0.88	0.96	1.04	1.12	1.2					
4.5	0.54	0.63	0.72	0.81	0.9	0.99	1.08	1.17	1.26	1.35					
5.0	0.60	0.70	0.80	0.90	1.0										
5.5	0.66	0.77	0.88	0.99	1.1										
6.0	0.72	0.84	0.96	1.08	1.2										

10. References were also consulted from the Italian case. In the country, terraces implementation began around the 1500s. Typical distances with fixed vertical spacing are reported in Table 9.5. In the implementation of the Rwanda LWH Project, a fixed vertical spacing of 1.5 m was adopted.

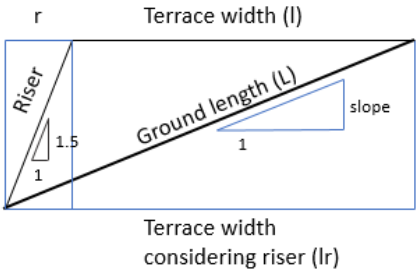
Table 9.5. Horizontal and Vertical Spacing Adopted in Italy and Rwanda

	Slope (%)														
	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Terrace height (m)	**Terrace width (m)**														
1.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2	3.8	3.6	3.3	3.1	2.9	2.8	2.6	2.5
1.5	12.5	10.7	9.4	8.3	7.5	6.8	6.3	5.8	5.4	5.0	4.7	4.4	4.2	3.9	3.8
2.0	16.7	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.1	6.7	6.3	5.9	5.6	5.3	5.0

11. The graphical method presented in the LWH Project guidelines prescribes a minimum soil depth of 0.75 m to implement the necessary excavation and filling activities for terraces construction; however, WOCAT technical sheets prescribe a soil depth of at least 1.2 m.

12. The riser slope should be adapted to the specific slope of the hillside considered; a V:H ratio of 1.5:1 is generally advised. A full overview of terraces dimensioning can be seen in figure 9.7.

Figure 9.7. Scheme for Terrace Geometrical Calculations



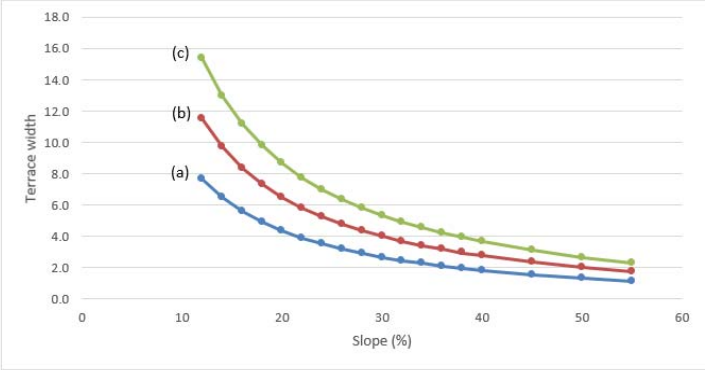
- $lr = \frac{v}{slope}$
- $r = \frac{v}{1.5}$
- $l = lr - r$
- $L = \sqrt{lr^2 + v^2}$
- $soil\ loss = (L - l)/L$

Table 9.6. Terraces Dimensioning

	Slope (%)																	
	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	45	50	55
Terrace height (m)	**Terrace width, considering riser (m) - lr**																	
1.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2	3.8	3.6	3.3	3.1	2.9	2.8	2.6	2.5	2.2	2.0	1.8
1.5	12.5	10.7	9.4	8.3	7.5	6.8	6.3	5.8	5.4	5.0	4.7	4.4	4.2	3.9	3.8	3.3	3.0	2.7
2.0	16.7	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.1	6.7	6.3	5.9	5.6	5.3	5.0	4.4	4.0	3.6
Terrace height (m)	**Terrace width (m) - l**																	
1.0	7.7	6.5	5.6	4.9	4.3	3.9	3.5	3.2	2.9	2.7	2.5	2.3	2.1	2.0	1.8	1.6	1.3	1.2
1.5	11.5	9.7	8.4	7.3	6.5	5.8	5.3	4.8	4.4	4.0	3.7	3.4	3.2	2.9	2.8	2.3	2.0	1.7
2.0	15.3	13.0	11.2	9.8	8.7	7.8	7.0	6.4	5.8	5.3	4.9	4.5	4.2	3.9	3.7	3.1	2.7	2.3
Terrace height (m)	**Ground length (m) - L**																	

1.0	8.4	7.2	6.3	5.6	5.1	4.7	4.3	4.0	3.7	3.5	3.3	3.1	3.0	2.8	2.7	2.4	2.2	2.1
1.5	12.6	10.8	9.5	8.5	7.6	7.0	6.4	6.0	5.6	5.2	4.9	4.7	4.4	4.2	4.0	3.7	3.4	3.1
2.0	16.8	14.4	12.7	11.3	10.2	9.3	8.6	7.9	7.4	7.0	6.6	6.2	5.9	5.6	5.4	4.9	4.5	4.2
Terrace height (m)	**Land loss (%)**																	
1.0	9	10	12	13	15	17	18	20	22	23	25	27	28	30	32	36	40	45
1.5	9	10	12	13	15	17	18	20	22	23	25	27	28	30	32	36	40	45
2.0	9	10	12	13	15	17	18	20	22	23	25	27	28	30	32	36	40	45

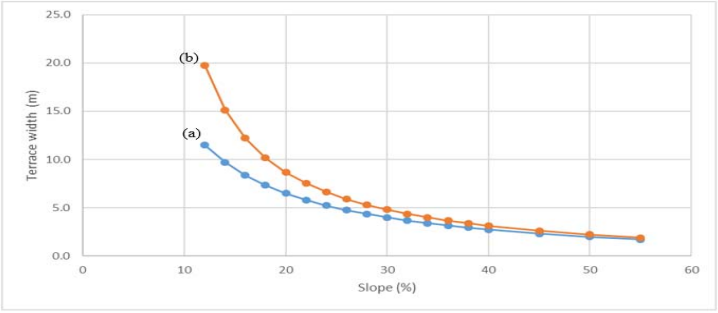
Figure 9.8. Slope - Terrace Width Relationships



Note: (a) 1 m terraces height, Oliva, 1938; (b) 1.5 m terraces height, Rwanda LWH Project and Oliva, 1938; (c) 2 m terraces height, Oliva, 1938; considering a riser with a H:V ratio of 1:1.5. Source: G. Castelli, F. Preti, World Bank mission February 2017

13. By inclining the terrace plan, it is possible to recover the soil lost with the land levelling and the riser (Figure 9.9); a detailed analysis is provided in Appendix A. It should be considered that with an inclined bench surface, drainage at the toe of the riser is impossible and that this solution hinders the possibility of employing machinery for terraces cultivation.

Figure 9.9. Slope - Terrace Width Relationships



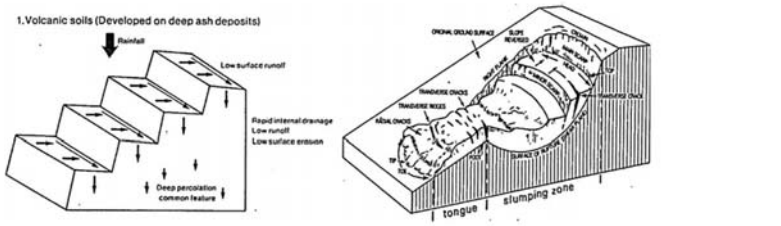
Note: (a) 1.5 m terraces height with 5 percent terrace bench slope; (b) 1.5 m terraces height, Rwanda LWH Project and Oliva, considering a riser with a H:V ratio of 1:1.5. Source: G. Castelli, F. Preti, World Bank mission February 2017

14. Nevertheless, the riser could be utilized for minor crop cultivations such as fodder. A riser with a milder slope can also be considered.

Drainage Systems

15. The correct design of the drainage system at the terrace level is vital for the stability of the terraced hillslope (Figure 9.10). A drainage canal must be built at the toe of the upper terrace, an additional drainage canal can be built at the toe of the terrace bund. The drainage channels should be connected to a cutoff drain or to a waterway. The slope of terrace drainage channels should be around 2 percent. In the most severe situations, underground drainage is possible (Figure 9.12).

Figure 9.10. Terraces with Good Drainage of Rotational Collapse



Terraces with good drainage (left) and features of a rotational slide or slump (right), due to insufficient percolation. Adapted from Carson (1989) and Asch (1980), respectively.

Source: Bizoza and de Graaff (2012)[36].

Figure 9.11. Example of Drainage Channels in Rwanda LWH Project

Figure 9.12. Underground Drainage - Italy

Narrow-Cut Terraces

16. Rwanda guidelines always refer to so-called 'narrow-cut terraces' to indicate terraces that should be implemented from 40 percent to 60 percent slope. The LWH guidelines prescribed a vertical spacing of 2 m in these conditions.

[36] Bizoza and de Graaff (2012) Financial cost–benefit analysis of bench terraces in Rwanda, Volume 23, Issue 2, March/April 2012, Land Degradation and Development.

Soil Fertility

17. Soil fertility management is vital for the effective implementation of radical terraces. Due to land movement, the first layer of soil tends to be altered, losing its structure and fertility. This can be avoided by removing the first layer of soil before cut and fill operations requested by terraces and by replacing it after earth works. In addition to this, soil fertilizer should be applied. Manure, compost, and chemical fertilizers are all possible. Two considerations should be made:

- In Burundi, the attempt of fertilization of radical terraces with chemical fertilizers failed, due to the inadequate rate of application. However, cattle breeding is not often present in Burundi and manure (and compost) collection could be difficult.

- In Rwanda, compost application, with appropriate training of farmers, provided good results with the following rates of application: 10 tons per ha over the three consecutive years period and evenly spread all over the surface of the fields before the rain.

Implementation

18. To provide a technical guideline for terraces implementation, documents from the successful case of Rwanda were consulted. The guidelines, named 'Illustrated Supervision Checklist for Assessment of the Quality of Comprehensive land-husbandry works at LWH Project sites, Ministry of Agriculture and Animal Resources of Rwanda, 2011' can be adopted for fieldwork, but some modifications would be required, to adapt the document to Burundian case. The implementation will be divided in two parts: the design phase and the building phase.

Design Phase

Land Suitability Assessment

19. Assessment of national/regional land suitability for terracing and other soil and water conservation measures considering soil type/depth, slope, and land use/land cover to identify areas for implementation. Reference for land conservation techniques appropriate for each slope are reported in Table 9.7. Reference for minimum soil depths are reported in Table 9.8.

Table 9.8**Table 9.7. Slope Bands for Land Conservation Techniques**

Slope (%)	Rwanda LWH Project (2011)	Slope (%)	Burundi, MINAGRIE (2010)
0–6	Grass strips	0–2	Grass strips
6–16	Progressive terraces	2–6	Grass strips and contour ditches
16–40	Radical terraces	6–25	Radical or progressive terraces
40–60	Narrow cut bench (radical) terraces	25–55	Narrow cut bench (radical) terraces
>60	Reforestation and soil bunds	>55	Reforestation

Table 9.8. Minimum Requested Soil Depth

	WOCAT (cm)	Rwanda LWH Project (cm)
Progressive terraces	>120	>50

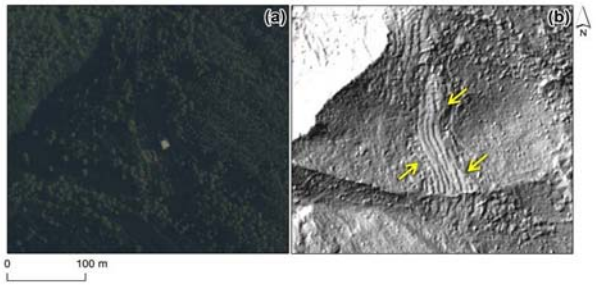
	WOCAT (cm)	Rwanda LWH Project (cm)
Radical terraces	>120	>75
Narrow cut bench (radical) terraces	>120	—

20. The design phase can take advantage of the Digital Elevation Models elaborated in the GIS environment, including the most recent Lidar imagery that can be realized through airborne sensors and allows land elevation analysis by removing the effect of vegetation (figure 9.13, example of Lidar imagery).

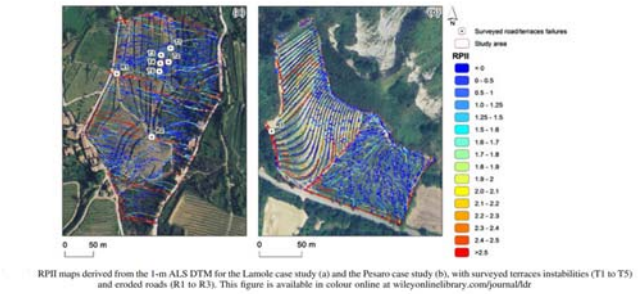
Topographic Analysis of Site

- Topographic survey of the study area (planimetry and altimetry)
- Identification of main drainage direction with Digital Elevation Model (flow accumulation) or RPII index[37]
- Identification of main elements on the terrain level (trees, rocks, water ponding areas, and so on)

Figure 9.13. Example of Lidar Imagery: (a) Satellite Image with Vegetation; (b) Elevation Model Derived from Lidar with No Vegetation Cover



[37] Tarolli P., G. Sofia, S. Calligaro, M. Prosdocimi, F. Preti, and G. Dalla Fontana. 2014. "Relative Path Impact Index (RPII): a Morphometric Approach to Quantify the Effect of Anthropogenic Features on Surface Flow Processes in Agricultural Landscapes." In: 2014 AGU Fall Meeting, San Francisco, 15–19 December 2015, AGU.
Figure shows an example of RPII application from the paper.



RPII maps derived from the 1-m ALS DTM for the Lamole case study (a) and the Pesaro case study (b), with surveyed terraces instabilities (T1 to T5) and eroded roads (R1 to R3). This figure is available in colour online at wileyonlinelibrary.com/journal/ldr

Historical Analysis of Land Management

21. Analysis of modification of land management according to the increase in agricultural mechanization to be reached.

Preliminary Hydraulic Works Design

(a) Consultation of land management laws and regulation

(b) Drainage system design, hydraulics, and hydrology, including waterways and cut-off drains

(i) Land management design:

- Terrain volume to be mobilized
- New road planning
- Agricultural assessment

(ii) Assessment of land rights reorganization

- Coordination of hillside land management with surrounding areas, to eventually include other zones and extend land management planning
- Reduction of conflicts related to neighbouring properties, drainage and water management, and road and mobility variations

(iii) Peer review evaluation of preliminary design and realization of a site development map

Building Phase

22. The main phases of field implementation are reported:

- Check of soil texture and depth with empirical or semi-empirical methods and eventual modification of the preliminary plan
- Realization of waterways, from the outlet to the tail end
- Realization of brushwood check dams in waterways
- Layout and construction of cut-off drains, starting from the outlet in the waterway to the tall end
- Realization of brushwood check dams in cut-off drains if slope exceeds 10 percent
- Terracing works, starting from the upper-most portion of the land next to a cut-off drain

- Compost application and lining

23. The most important feature to be respected in terracing implementation is to realize drainage works (waterways and cutoff drains) before the implementation of terracing works. Once the canal system is realized, it is vital to have the check dam system ready before the major rainy season, to prevent damage to the drainage network.

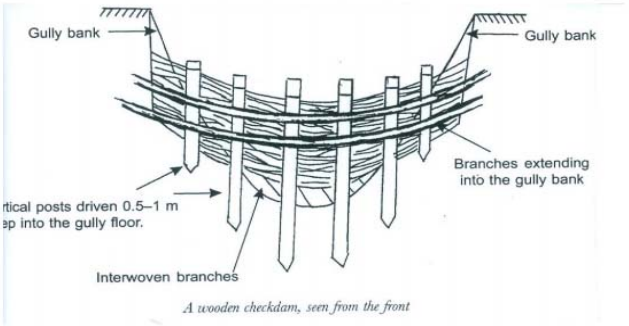
Adoption of LWH Implementation Manual

24. Rwanda-based LWH Project Manual, Illustrated Supervision Checklist for Assessment of the Quality of Comprehensive land-husbandry works at the LWH Project sites, Ministry of Agriculture and Animal Resources of Rwanda 2011, represent a useful baseline document that is advisable to be adopted for the BLRRP, with some necessary modifications.

25. The following modifications are required to the document to be effectively used:

- Slope ranges and interventions proposed (see table 9.7) should be adapted to the final setting that will be adopted in the BLRRP.
- References to agroecological zones should be adapted to Burundi.
- Plants and trees proposed for land rehabilitation and bund reinforcement should be referred to Burundian species.
- Check dams and other wooden (or soil bioengineering) works should be adequately dimensioned (Figure 9.14).
- Compost, manure production, and animal traction should be reconsidered for Burundi, or adequately implemented.

Figure 9.14. Wooden Check Dam from the LWH Project, With No Dimensioning



Resettlements

26. Resettlements for terraces implementation is not necessary. Terracing earth movement could be interrupted around settlements or single buildings and single houses, and continued downstream (Figure 9.15). The drainage system should be designed to evacuate runoff from house as well as from terraces.

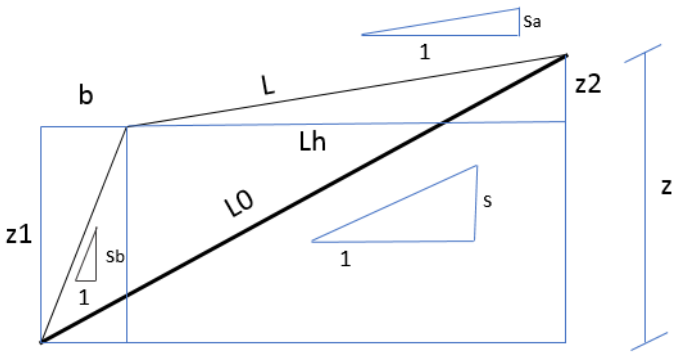
Figure 9.15. House in Terraced Hillslope in Rwanda LWH Project

Source: G. Castelli, World Bank mission February 2017.

APPENDIX A: TERRACES CALCULATION WITH INCLINED PLAN

27. This appendix shows the calculation needed for evaluating the soil loss for terraces with an inclined plan.

Figure 9.16. Scheme of Calculations for an Inclined Terrace Plan



- $b = \frac{z1}{sb}$
- $Lh = \frac{b \cdot s - z1}{sa - s}$
- $z2 = Lh \cdot sa$
- $z = z1 + z2$
- $L = \sqrt{Lh^2 + z2^2}$
- $L0 = \sqrt{(Lh + b)^2 + z^2}$
- $Soil\ loss = \frac{L0 - L}{L0}$

Given

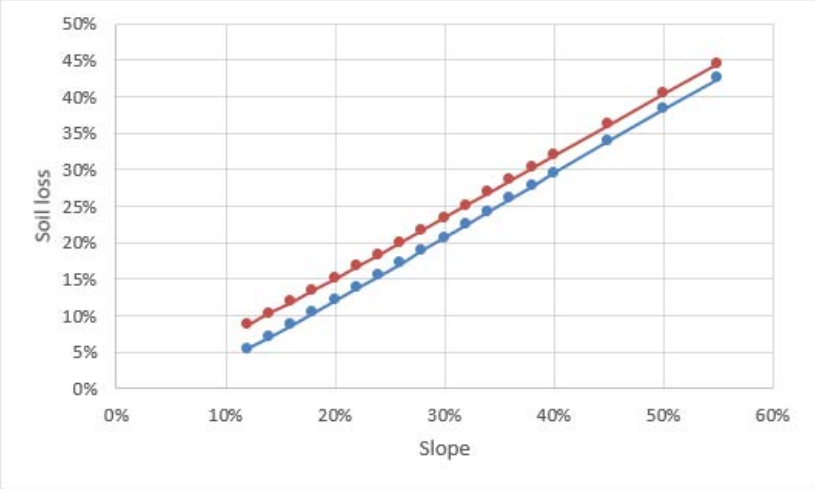
- z1 = 1.5 m
- sb = 150 percent
- sa = 5 percent

Table 9.9. Calculations Result for Inclined Terrace Plan

Slope	Alfa	Lh	Z2	Z	L	L0	Loss
%		m	m	m	m	m	%
12	6.8	19.7	0.99	2.49	19.74	20.9	5
14	8.0	15.1	0.76	2.26	15.13	16.3	7
16	9.1	12.2	0.61	2.11	12.20	13.3	9
18	10.2	10.2	0.51	2.01	10.17	11.3	10
20	11.3	8.7	0.43	1.93	8.68	9.9	12
22	12.4	7.5	0.38	1.88	7.54	8.7	14
24	13.5	6.6	0.33	1.83	6.64	7.8	15
26	14.6	5.9	0.30	1.80	5.91	7.1	17
28	15.6	5.3	0.27	1.77	5.31	6.5	19
30	16.7	4.8	0.24	1.74	4.81	6.1	21
32	17.7	4.4	0.22	1.72	4.38	5.6	22
34	18.8	4.0	0.20	1.70	4.00	5.3	24
36	19.8	3.7	0.18	1.68	3.68	5.0	26
38	20.8	3.4	0.17	1.67	3.40	4.7	28
40	21.8	3.1	0.16	1.66	3.15	4.5	29
45	24.2	2.6	0.13	1.63	2.63	4.0	34

Slope	Alfa	Lh	Z2	Z	L	L0	Loss
%		m	m	m	m	m	%
50	26.6	2.2	0.11	1.61	2.22	3.6	38
55	28.8	1.9	0.10	1.60	1.90	3.3	43

Figure 9.17. Slope - Soil Loss Relationships



Note: For Horizontal Terraces Plan (red) and Terraces Plan with a Slope of 5 percent (blue).
Source: G. Castelli, F. Preti, World Bank mission February 2017

ANNEX 10: WATER HARVESTING

COUNTRY: Burundi
Burundi Landscape Restoration Project

1. This annex covers the technical details for the implementation of water harvesting techniques in the commune of Buhinyuza (Muyinga Province) for tackling water scarcity issues that may hamper landscape restoration activities. World Bank missions conducted in February and March 2017 revealed that Buhinyuza commune, located in the driest area of the country, is severely affected by water scarcity issues. Meetings with local farmers and authorities confirmed the necessity to improve water conservation in degraded landscapes to secure the implementation of landscape restoration with reforestation and improved agricultural activities.

2. Water harvesting, the collection and concentration of rainwater and surface runoff for anthropic activities and environment, has been identified as a valuable means for maximizing the benefit of short and intense rain in the region.

3. Through water harvesting, excess rainfall and the overland flows occurring after summer rains can be retained in the soil and can represent a source of available moisture for agricultural activities, rangeland development, and reforestation. Most of all, water harvesting has a significant impact in the dry periods between two distant rain events (dry spells), that can occur in arid and semi-arid areas and that can severely damage crop cultivations and environmental restoration activities, especially if they occur in the growing period.

4. Different water harvesting techniques could be considered while planning the implementation of water conservation measures, and an overview is given in the following sections.

Site and Techniques Selection

5. The first constraint for water harvesting implementation is represented by soil type. Suitable soils for water harvesting structures should present the following characteristics:

- Loamy texture (medium textured soils)
- Depth larger than 1 m—ideally around 2 m
- Low salinity

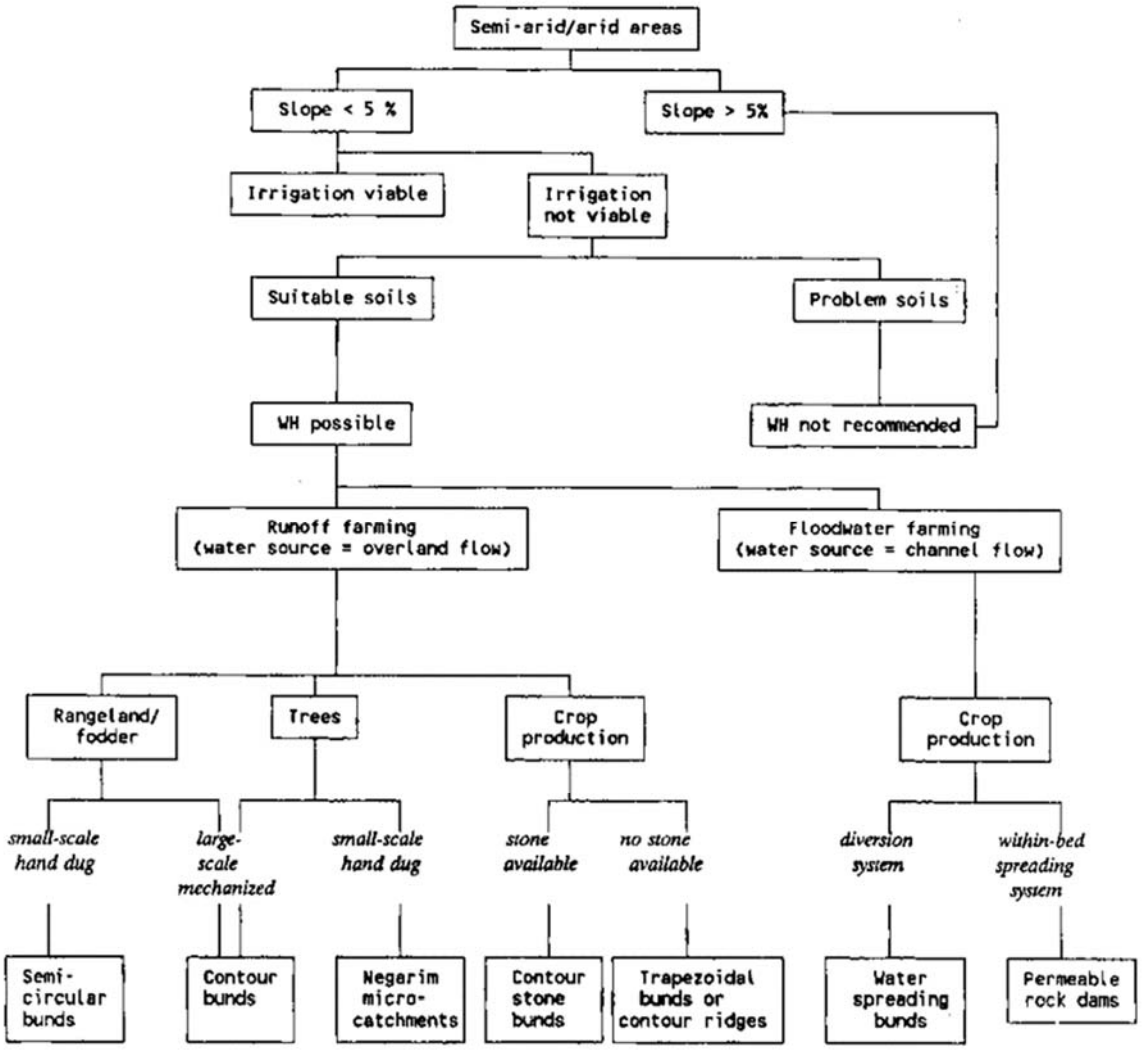
6. Soil should not be compacted and sandy soils must be avoided.

7. Water retention capacity of the soil is an additional feature that can contribute to the effect of water harvesting, and that is directly linked with the structure of the soil given by the organic content. In arid areas, soil structure is often weak due to the low fraction of organic matter in the soil. Due to this, increasing soil fertility with manure or other fertilizers can contribute to the effectiveness of water harvesting in arid climates.

8. Figure 10.1 shows the FAO chart for the selection of water harvesting systems according to the

project characteristics and use that represent a quick and solid reference for system implementation and is adopted in the present document.

Figure 10.1. Water Harvesting System Selection



Source: FAO 1991.

9. The FAO diagram considers only the slopes lower than 5 percent, while in the area to be rehabilitated, steeper slopes may occur. Other references[38] were also consulted for suitable techniques to be considered.

[38] *Source:* Grum, B., R. Hessel, A. Kessler, K. Woldearegay, E. Yazew, C. Ritsema, and V. Geissen. 2016. "A Decision Support Approach for the Selection and Implementation of Water Harvesting Techniques in Arid and Semi-arid Regions." *Agriculture Water Management* 173: 35–47; Mekdaschi Studer, R. and H. Liniger. 2013. *Water Harvesting: Guidelines to Good Practice.* Centre for Development and Environment (CDE), Bern; Rainwater Harvesting Implementation Network (RAIN), Amsterdam; MetaMeta, Wageningen; The International Fund for Agricultural Development (IFAD), Rome.

Table 10.1. Proposed Water Harvesting Techniques[39]

Water Harvesting Technique	Land Use	Soil Properties	Annual Rainfall (mm)	Topography	Limitations
Negarim micro-catchments	Cultivated land, bare/shrub land with slope 1–5%	Thick soils (at least 1.5 m deep)	100–400	Even and uneven micro-catchments	Cannot be mechanized
Semi-circular bunds/half-moons/ triangular bunds	Bare/shrub land, cultivated land with slope 0.5–5%	All soils not shallow and saline	200–750	Even topography	Cannot be mechanized, requires regular maintenance
Trapezoidal bunds	Bare/shrub land, grazing land, cultivated land with slope 0.25–1.5%	Soils with good constructional properties	250–500	Area within bunds should be even	Limited to gentle slopes
Eye brows	Bare/shrub land with slope 1–50%	Shallow to medium soils	200–600	Even and uneven topography	Not effective in very low rainfall areas, cannot be mechanized
Contour earth bunds - up-slope (*fanya juu*)	Cultivated land with slope 5–16%	Moderately deep loamy soils	500–1,000	Hill slopes and footsteps	Loss of land for terrace bund, high labor input
Contour earth bunds - down-slope (*fanya chini*)	Slopes of 1–25%	All types of relatively permeable soils	300–600	Hill slopes and footsteps	Loss of land for terrace bund, high labor input
Household/farm ponds	Bare/shrub land, cultivated land with slope 0–10%	Sandy clay loam with moderate infiltration rate	200–750	Not necessarily even	Siltation/deposition, water loss due to infiltration for porous media

[39] *Source:* Grum, B., R. Hessel, A. Kessler, K. Woldearegay, E. Yazew, C. Ritsema, and V. Geissen, V. 2016. "A Decision Support Approach for the Selection and Implementation of Water Harvesting Techniques in Arid and Semi-arid Regions." *Agriculture. Water Management* 173: 35–47; Mekdaschi Studer, R. and H. Liniger 2013. *Water Harvesting: Guidelines to Good Practice.* Centre for Development and Environment (CDE), Bern; Rainwater Harvesting Implementation Network (RAIN), Amsterdam; MetaMeta, Wageningen; The International Fund for Agricultural Development (IFAD), Rome.

10. Considering the FAO diagram, semicircular bunds, Negarim micro-catchments, contour bunds and trapezoidal bunds have been considered. Other references were also consulted, and 'eyebrows' that can be implemented in slopes up to 50–60 percent have been included in the list of suitable techniques for the Buhinyza case. Also, household solutions, like farm ponds, are proposed.

11. **Negarim micro-catchments** are diamond-shaped basins surrounded by an earthen bund with an infiltration pit in the lowest pint—they are typically used for tree production.

12. **Semi-circular bunds** are earthen embankments with the shape of a semicircle. They can have varied dimensions and they can be used for tree production, rangeland rehabilitation, and fodder.

13. **Trapezoidal bunds** are bunds that impound a large catchment with a trapezoidal shape. Overflow discharge is spilled over by the edge of the wingwall of the basin.

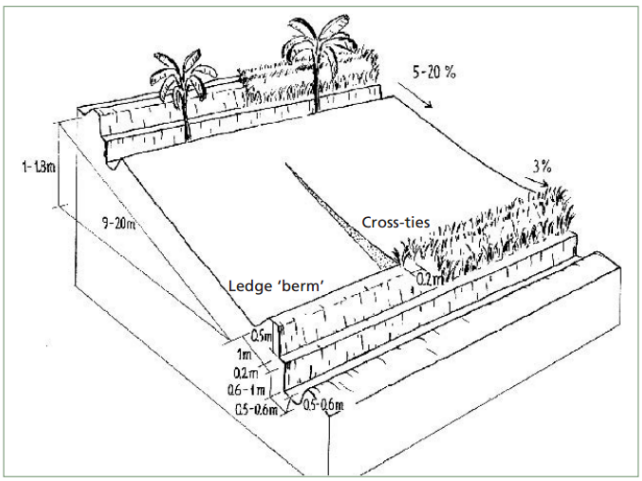
14. **'Eyebrows'** are small water harvesting bunds with the shape of an 'eyebrow' allowing in situ moisture harvesting for landscape rehabilitation and tree production.

Figure 10.2. Eyebrow - India[40]

15. **Contour earth bunds** up-slope (fanya juu) are earthen bunds that follow the contour lines. They are basically progressive terraces with a trench, dug below the terrace bund. Trenches are around 50–60 cm deep and may have crossties at 10 m intervals.

[40] *Source:* Mekdaschi Studer, R., and H. Liniger. 2013. *Water Harvesting: Guidelines to Good Practice.* Centre for Development and Environment (CDE), Bern; Rainwater Harvesting Implementation Network (RAIN), Amsterdam; MetaMeta, Wageningen; The International Fund for Agricultural Development (IFAD), Rome.

Figure 10.3. Contour Earth Bunds - Up-Slope (fanya juu)



16. **Contour earth bunds** down-slope (fanya chini) are earthen bunds realized on the model of progressive terraces, with trenches above the earthen bund to collect overland flows. They are used for hillslope rehabilitation and tree plantation and they could avoid erosion and stabilize hillslopes.

Figure 10.4. Contour Earth Bunds - Down-Slope (fanya chini) Scheme

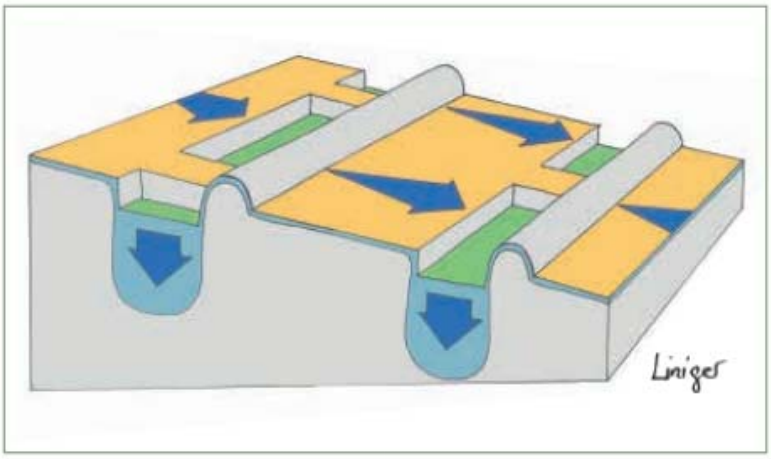


Figure 10.5. Contour Earth Bunds with Downstream Pits in Ethiopia

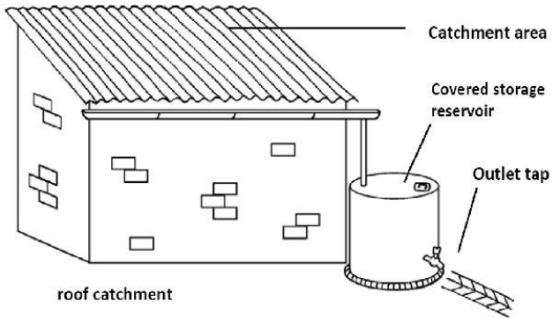
Source: University of Florence - Department of Agricultural, Food and Forestry Systems (GESAAF)

17. **Household/farm ponds** are typically ponds located in the lowest point of farm or household land natural catchments. They can be improved with the impermeabilization of soil with plastic film or clay.

Figure 10.6. Farm Pond with Rooftop Collection - Guatemala, Region of Corridor Seco

Source: University of Florence - GESAAF.

Figure 10.7. Scheme of Household Tank with Rooftop Collection System



18. Regarding the rationale of the BLRRP, suitable techniques to be considered are the ones that can be used in combination with progressive terraces such as contour earth bunds up-slope (fanya juu) and contour earth bunds down-slope (fanya chini). Implementation of in-situ water harvesting, like semicircular bunds, negarim, and eyebrows should be tested. Household and farm ponds may also represent a suitable technique to be introduced trough the FFSs. Trapezoidal bunds might be too complicated to implement for the context, due to the large amount of area needed and the limited slope range, but their use will be evaluated.

19. The appropriateness of the described techniques will be analyzed on site, for verifying soil texture, slope, and the possible interaction with progressive terraces.

Implementation

20. In implementing water harvesting, the socioeconomic aspects are particularly important. The local population must be aware of the technology and happy with the technical choice, which should be appropriate and feasible for maintenance.

21. Two project approaches are identified by the FAO guidelines (1991).

The Demonstration, Training, and Extension Approach

22. The technology introduced by the project is relatively simple, and costs per hectare are low. The intention is to promote systems which can be taken up and implemented by the people themselves, with a minimum of support. The philosophy behind this approach is that the people themselves must be the prime movers in the development of their own fields and local environment.

The Implementation Approach

23. In this approach, the technology may be simple or complex, but it is implemented by the project itself. Machinery is often used, but some projects employ paid (or otherwise rewarded) labor. Costs are often relatively high. The intention is that the project will quickly and efficiently rehabilitate land for the people. The philosophy is that people are simply unable to undertake the extent of work required using their own resources and, therefore, they require considerable or complete support to implement the project.

24. Throughout the years, the first approach has offered the most promising results for sustainability once the project has come to an end. Nevertheless, situations where the introduction of appropriate machinery is justified, together with financial support for labor, can be present.

25. Incentives for water harvesting implementation are possible, especially in the form of food for work and tools for work. Cash incentives are possible, but they should not be excessive. To guarantee sustainability, maintenance should not be subsidized, with it being a farmers' own duty.

Implementation Plan

26. The BLRRP will fund the realization of progressive and radical terraces in the hillslope of Muyinga Province, affected by severe water scarcity. In the first phase of the project (three years), implementation

will be piloted in seven *collines* of Buhinyuza commune. The FFS will be realized to train farmers in the most appropriate techniques for landscape restoration.

27. The proposed project approach is in between the Demonstration, Training, and Extension Approach and the Implementation Approach. It is proposed to do the following:

- Preliminary assessment on land suitability and identification of: (a) suitable sites in Buhinyuza commune, (b) suitable techniques to be implemented, and (c) possibility fertilization of soil with compost/manure for increasing soil structure.
- Implement the 20 percent of progressive terraces in the pilots of Buhinyuza commune with water harvesting techniques that can be integrated in the design (for example, contour earth bunds down-slope [fanya chini])—lower or no additional costs will be needed.
- Train farmers of Buhinyuza FFS on water harvesting and on fertilization of soils.
- Subsidize with tools for work and seeds for work farmers of Buhinyuza who will implement in-situ water harvesting in their households and/or brand new radical terraces.
- Monitor project implementation and realize water harvesting guidelines for upscaling water harvesting at the province and national levels.
- Subsidize household and farm ponds.

ANNEX 11: LAND CERTIFICATION

COUNTRY: Burundi
Burundi Landscape Restoration Project

Approach

Rationale for the Land Component

1. The land component of the Landscape Restoration and Resilience Project is justified on several grounds: owing to the massive registration of the local populations' land rights and the resulting decrease in land disputes,[41] the land component will contribute to social peace, sustainability of land-use planning, and improved agricultural and rural productivity in the intervention communes of the project. One can assume that clarifying and securing land rights in the intervention sites can contribute, on one hand, to the increase of agricultural productivity, in parallel with other project activities (watershed management, agricultural development), and on the other hand, to ownership and maintenance, and therefore, to the sustainability of the management activities.

2. Preliminary identification, demarcation, and registration of properties will facilitate management operations, particularly terracing. It is advisable that before terracing, whether radical or progressive, each property be adequately identified and if possible, registered. The vast majority of terraces will be done on private *colline* lands (very small portion of public lands on *colline* watersheds), which is the ultimate scope of competence of the CLS. The presence of a CLS will help engage the local structures (implementation of recognition commissions for each *colline*), as well as the capacities of the CLS (awareness, information, and engagement of the populations, public and contradictory/adversarial operations to recognize property rights, demarcation, mediation of land conflicts to reach amicable resolution), to clarify and formalize land rights, before any management operations, and hence, constrain any future challenges once the developments are finalized.

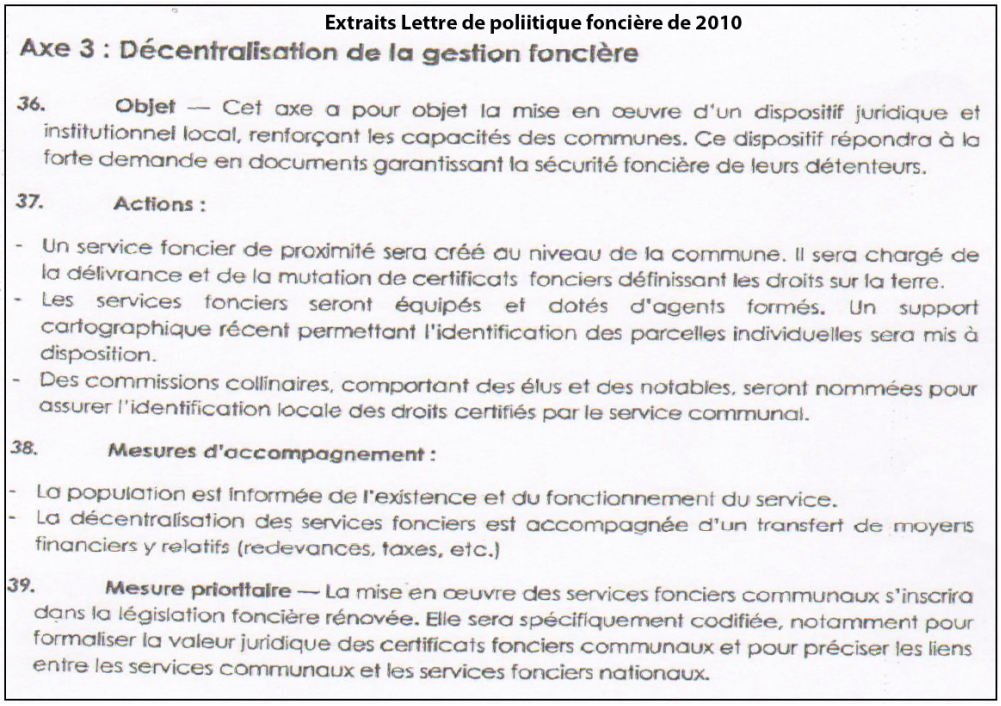
3. In addition, the hiring of land agents and the use of numerous support agents to carry out the massive registration operations (in general, young people recruited locally, ensuring gender equality), will have a positive impact on the local economy.

[41] As a matter of fact, over the course of their operation, the LRLC (local reconnaissance land commission) tend to rather increase the number of open land conflicts, or made public to the CRC, traditional or administrative authorities in charge of the *collines*, communal authorities, or local courts. However, the LRLC implemented under the land projects supported by the Swiss Cooperation showed that a significant number of such conflicts (on boundaries, questionable sales, successions, and so on) were amicably resolved during the operation. After the LRLC, a surge of land conflicts brought before a local court is observed, because the parties involved in durable conflicts are advised to bring the case to a local court. Despite this increase of land conflicts, during or immediately after an LRLC, it still has several advantages: (a) decrease of latent conflicts, and (b) creation of conditions enabling a pacific resolution of land conflicts, due to the knowledge acquired by local actors during field operations. In addition, it would be pointless to hope for the absence or near absence of land conflicts after such operations. Conflicts are inherent to land issues, and there will always be new succession issues, which might lead to domestic land conflicts, or the questioning of rights or boundaries. However, it can be assumed that the LRLC, combined with an efficient registry of changes, can globally reduce the number of conflicts, and particularly those related to disputed boundaries (strengthening of vegetal demarcation, public and contradictory/adversarial recognition of boundaries) and questioned sales.

A National Context Favorable to a Massive Securing of Land Rights

4. The legal and institutional framework has been reviewed and assessed and is acceptable for implementation. Indeed, Burundi has initiated a land reform since 2008 and has today a legal, institutional, and procedural framework that enables massive registration of land rights, with the potential of simultaneously developing land conflict resolution activities. The Land Policy Paper, adopted in 2010 and the 2011 Land Code and its implementation decree of 2016 define a political, legal, and regulatory framework for the decentralization of land management. This framework provides for the creation of CLSs for local, public, and contradictory/adversarial operations of recognition of land rights. Following such operations, and in the absence of any opposition, landowners obtain a land certificate. Compared to the preexisting system of land registration (delivery of land titles by the state land services), the land certification arrangement is more accessible and affordable for rural households. In addition, it relies on a local, public, and contradictory/adversarial recognition of land rights, giving the land certificate a real community value, in addition to its legal value recognized by the 2011 land code.

Figure 11.1. Excerpts from the 2010 Land Policy Letter



Extraits Lettre de poliitique foncière de 2010

Axe 3 : Décentralisation de la gestion foncière

36. **Objet** — Cet axe a pour objet la mise en œuvre d'un dispositif juridique et institutionnel local, renforçant les capacités des communes. Ce dispositif répondra à la forte demande en documents garantissant la sécurité foncière de leurs détenteurs.

37. **Actions :**

- Un service foncier de proximité sera créé au niveau de la commune. Il sera chargé de la délivrance et de la mutation de certificats fonciers définissant les droits sur la terre.
- Les services fonciers seront équipés et dotés d'agents formés. Un support cartographique récent permettant l'identification des parcelles individuelles sera mis à disposition.
- Des commissions collinaires, comportant des élus et des notables, seront nommées pour assurer l'identification locale des droits certifiés par le service communal.

38. **Mesures d'accompagnement :**

- La population est informée de l'existence et du fonctionnement du service.
- La décentralisation des services fonciers est accompagnée d'un transfert de moyens financiers y relatifs (redevances, taxes, etc.)

39. **Mesure prioritaire** — La mise en œuvre des services fonciers communaux s'inscrira dans la législation foncière rénovée. Elle sera spécifiquement codifiée, notamment pour formaliser la valeur juridique des certificats fonciers communaux et pour préciser les liens entre les services communaux et les services fonciers nationaux.

Source: Burundi Government

Figure 11.2. First Page of a Land Certificate

Certificat foncier délivré par le Service Foncier Communal

REPUBLIQUE DU BURUNDI

Sceau du ministère en charge des terres rurales:
Province :
Commune :

Certificat foncier
n° _____

le ____/____/20____
L'Administrateur communal
Nom et prénom : _____
Signature et sceau de la commune

Figure 11.3. Excerpts from the 2011 Land Code

Extraits du code foncier de 2011

Article 313 :

Le droit de propriété foncière peut être établi :

- soit par un titre foncier établi par le Conservateur des Titres Fonciers.
- soit par un certificat foncier établi par le Service foncier communal reconnaissant une appropriation régulière du sol se traduisant par une emprise personnelle ou collective, permanente et durable, selon les usages du moment et du lieu et selon la vocation du terrain.

Article 384:

Pour la mise en œuvre de la procédure de certification, dans le respect de la législation communale, la commune met en place un Service foncier communal chargé notamment :

1° d'identifier et de sécuriser les modes d'appropriation du sol reconnus et protégés par la loi, à l'exception des terres enregistrées, des zones protégées et des terres domaniales et des établissements publics ;

2° d'archiver et de conserver les documents et plans relatifs aux droits fonciers sécurisés ;

3° d'assurer la gestion du domaine immobilier de la commune et notamment d'en tenir l'inventaire à jour ;

4° d'appuyer et assister les opérations d'enquête foncière prescrite dans les opérations de gestion domaniale.

Le Service foncier communal fonctionne sous la direction et la responsabilité de l'Administrateur communal.

Already very Significant Achievements in Decentralized Land Management

5. Around 50 CLSs have already been established. They allow individual applications for land certification (see figure 11.4). The land project of the Swiss Cooperation devised the principle of the LRLC

-in French - in 6 communes of Ngozi Province. This approach was successfully replicated and developed by the NGO ZOA, with the support of the Dutch Cooperation. The LRLC approach systematically processes all plots and issues related land certificates on a *colline* or a small area (see figure below). Therefore, the land rights of all (men or women, family or bought lands, and so on) are recognized and can be legally certified. In addition, contentious plots are the subject of a mediation attempt, which in many cases, results in an amicable settlement that can be later adopted through the delivery of a land certificate.

6. The establishment procedures for a CLS, as well as the land right recognition and certification procedures, in answer to individual requests or under an LRLC, are already well established. The existence of a recent orthophotography for the entire country facilitates the demarcation of plots. In addition, Burundi has a significant number of national managers and trainers, with the capacity to support communes in creating and operating their CLS. The presence and emergence of NGOs/consulting firms are also noted, which can significantly contribute to the implementation of the project. This orthophotography is georeferenced in the WGS84 geodetic system and in the UTM 38S mapping projection which corresponds to the national coordinate reference system.

Figure 11.4. Scheme of Instruction of an Individual Application for a Land Certificate

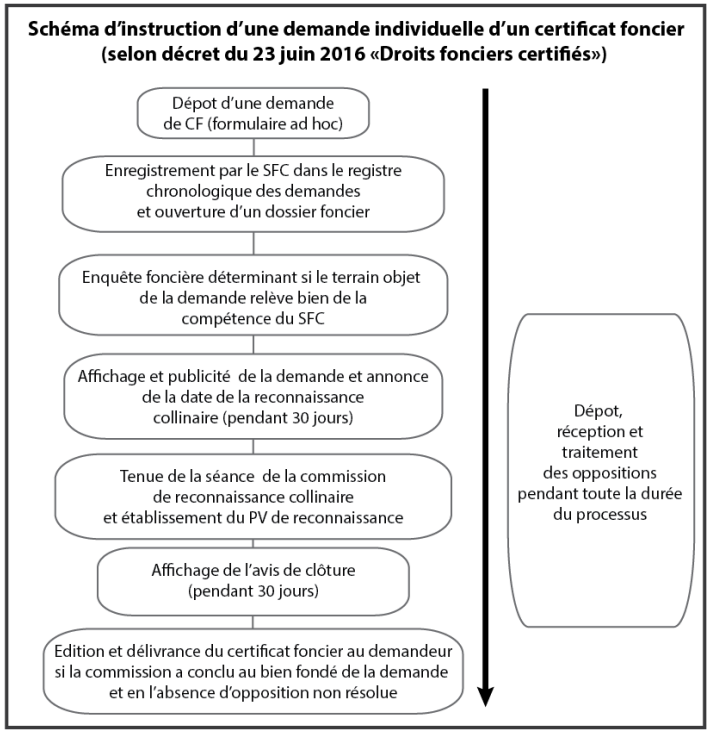


Figure 11.5. Scheme of LRLC Approach

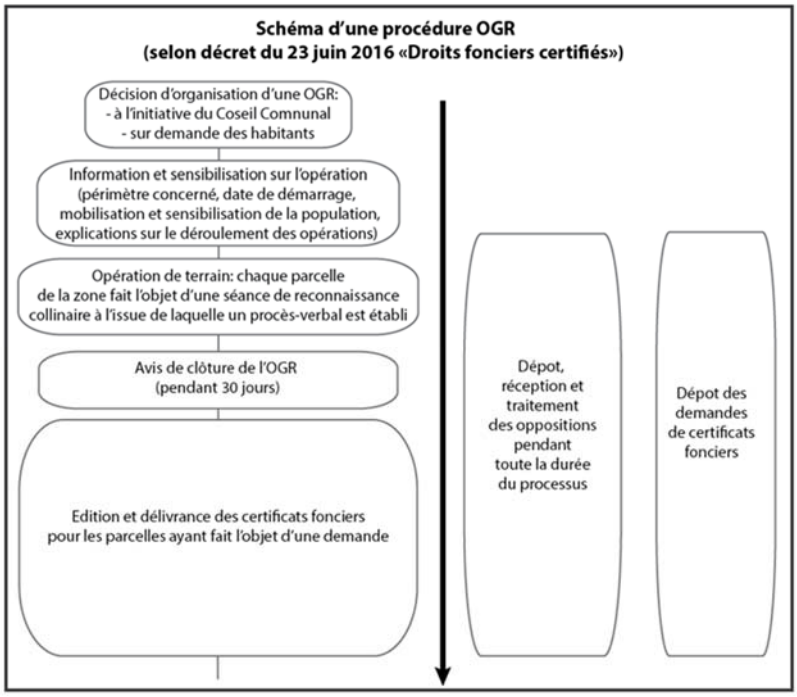
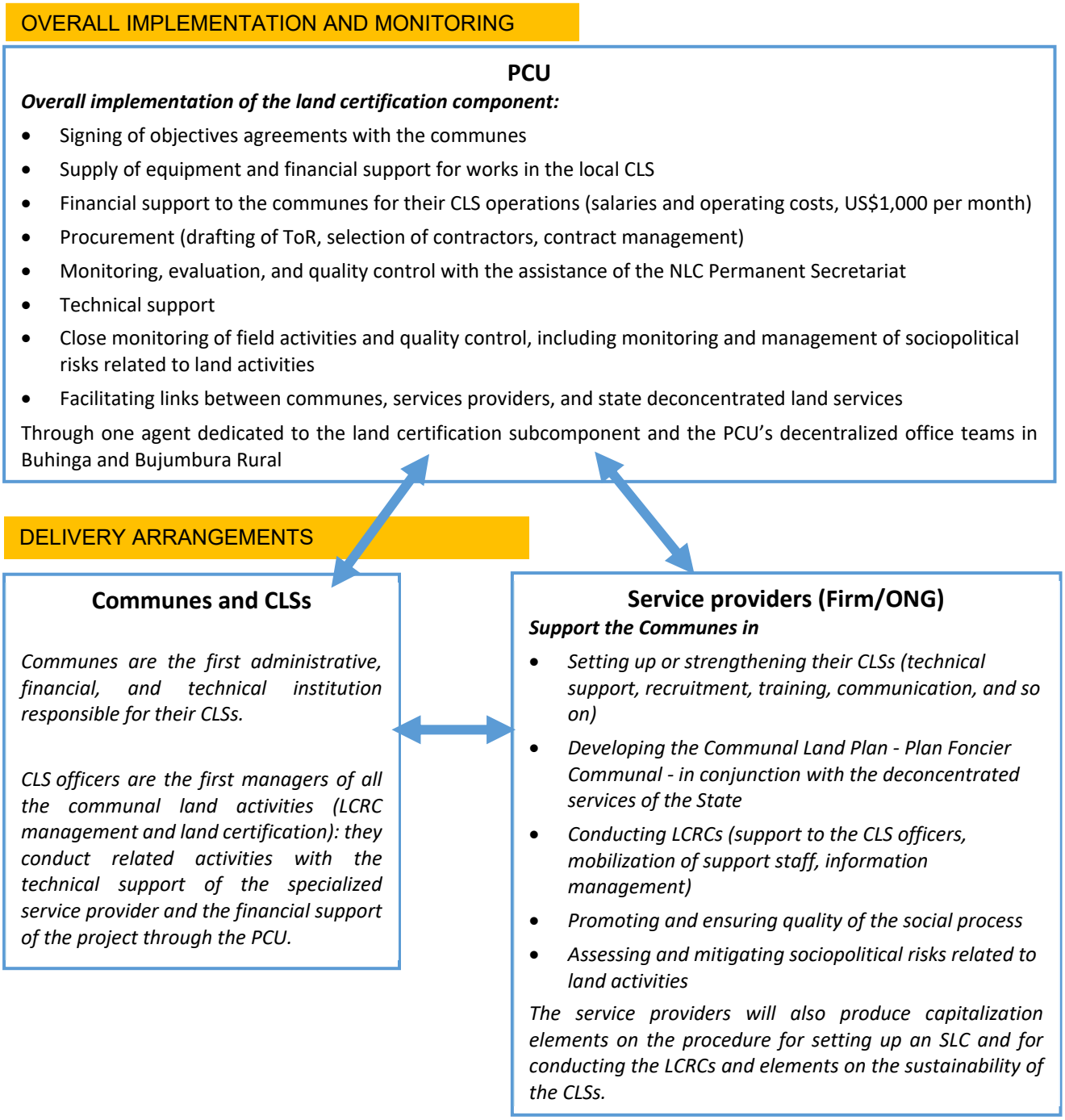


Figure 11.6. Proposed Implementation Arrangements for the Land Certification



Note: Two procurements will also be awarded to carry out two studies, one on the production of a revised Procedures Manual and the other on the sustainability of the CLSs.

7. Compared to certification originating from individual requests, the LRLC have several advantages: (a) processing of all types of land ownership origins (family lands, purchase, donation, abolition of

bondage, and so on) and not only of purchased plots, as it is the case for individual requests; (b) economies of scale (reduced unit cost) and increased rate of plot recognition; (c) generation of a true community dynamics, at the level of the *colline*; (d) systematic mediation attempt for land conflicts and encouraging results in terms of conflict resolution; and (e) facilitation of the release from a family's undivided status.

8. There is a wealth of literature on the approach and procedures for the creation of a CLS (analysis of the social and land ownership, financial, and material status of the commune; institutional establishment; material arrangements for the CLS in terms of office, equipment, and land-related documentation; determination of certification costs; hiring and training of land agents; information—awareness of population; establishment of LRLC toward systematic issuance of land certificates) and its operation (certification procedures based on individual demands or under an LRLC, management of changes, property registry, development and management of communal land plans). The documents that will be useful to implement the project include (a) the MEEATU/UC-PNF (Unité de Coordination du Programme Foncier) guidelines for the establishment and operation of the CLSs, (b) Gutwara Neza, practical guidance for the management of the CLSs, ABELO (Association Burundaise des Elus Locaux); (c) ABELO guidance for the implementation of a CLS; MEEATU, UC-PNF, and National Training Center for Local Stakeholders; 10 training modules for the actors of the decentralized land management; and so on.

9. There are numerous guidelines and documents to help establish and operate CLSs. The project will contribute to the development of a reference document to implement and operate CLSs. This document will be developed in consultation with all actors involved in decentralized land management and will be endorsed by the Government. It will help future projects align with an adequate approach, validated by the national authorities, and to avoid the risk of scattered initiatives.

10. Burundi has made significant progress in decentralizing land management, with 48 CLSs already created and 4 new ones under way. Some of the communes in the provinces covered by the Landscape Restoration and Resilience Project, with the exception of the Bujumbura Rural Province, already have CLSs. Regarding the two first pilot communes of the Landscape Restoration and Resilience Project, one (Buhinyuza) has already created its CLS but the other (Isale) not yet.

Activities, Planning, and Estimated Costs for the Selected Option

11. Table 11.1 describes the planned activities, identifying the following:

- The activities planned in the first two communes, Buhinyuza and Isale, including CLS establishment or strengthening and support in these two pilot communes and the processing of an LRLC in seven and five *collines*, respectively; the balance of 10 *collines* may involve a third commune.

- Institutional support at the national level: capacity building of the NLC Permanent Secretariat team to monitor and control the quality of the activities of the CLSs, contribution to the development of a viable economic model for the CLSs, and development of a reference manual, validated at the national level, on the establishment of a CLS and the implementation of an LRLC.

- Activities to establish or strengthen and support the CLSs in the other project communes (assuming 12 additional communes) and implementation of additional LRLC to cover at least the equivalent of 24,000 ha.

Table 11.1. Unit Costs for the Land Certification Subcomponent[42]

Activity	Unit	Cost (US$)	No. of Units	Total
Establishment of a CLS	Per CLS	72,000	3	216,000
Operational support to a CLS	Annual per CLS	12,000	14	168,000
Development of initial Communal Land Plans	Per CLS	24,000	3	72,000
LRLC	Per *Colline*	48,000	22	1,056,000
TOTAL				1,512,000

12. The average unit cost to establish a CLS is about US$72,000. It includes information and awareness sessions for communal authorities and development of a participatory land assessment; support to the administrative creation of the service and drafting of a convention between the commune and the project; support to the hiring of CLS agents (in general two agents); thorough training of these agents; support to the renovation of the building for the service; equipment (furniture, including for land registry, motorcycles, basic topographic material, land-related documentation); information and awareness sessions for the population of the *collines*; and constitution of the CRCs (Commission de Reconnaissance Collinaire) and training of their members. The average unit cost to develop a Communal Land Plan is about US$24,000.

13. The average annual unit cost to support the operation of a CLS is estimated at US$12,000. This includes the salaries of the CLS agents, fuel and maintenance for motorcycles, consumables (land-related documentation, software), communication fees, refresher trainings, and support and advice to the service (communal authorities, service agents).

14. The unit cost to conduct an LCRC operation (systematic issuance of land certificates) for a *colline* is indicative and should be refined after the first pilot LRLC carried out under the project. This cost is estimated at US$48,000 per *colline*.[43] This includes the wages of support agents (field and office), travel costs, consumables, agent equipment and training, and workshops organized with the CRC members.

15. These costs include the monitoring, quality control, and evaluation activities (estimated at 20 percent of base costs).

[42] Values indicated are given without consideration of implementation entity (for example, the CLS or service provider). See previous figure. In general, the PCU will provide financial support to CLSs for their salaries and operational costs, while technical needs and extra costs drawing from the intense LRLC activities are expected to be covered by the service provider (for example, training, communication, analytical work, and support staff mobilization for LRLC operations).
[43] The evaluation will aim at generating unit cost per operation (that is, issued certificate) in addition to current estimates per hectare.

Organization of Activities

16. The various activities of the land component will be led and coordinated by the MEEATU, through the NPSC, PCU, and PPCU, in close cooperation with the communal and provincial authorities and the Permanent Secretariat of the NLC.

17. Support to the communes, to create their CLS and conduct their land certification activities, will be carried out by service providers (consultants, consulting firms, or NGOs).

18. Monitoring and quality control activities will be jointly carried out by the PPCU and the NLC Permanent Secretariat, which has the mandate to ensure the monitoring and quality control of the CLSs. Service providers will be mandated to develop the reference manuals and carry out the study on economic sustainability and the impact assessments. The governmental services working on land management (General Directorate for Land Planning, Directorate of National Registry, Directorate of Land Titles) will be in charge of developing the communal land plans.

Risk Assessments and Mitigation Measures

19. Several risks were identified:

- Slowness/hindrance of activities due to administrative burdens ➔ involve all actors including the communal actors and those from the decentralized governmental services.
- Hindrance or even standstill of activities due to the deterioration of the security situation ➔ difficult to control.
- Escalating land conflicts (inherent to any systematic land registration process) ➔ There is no such thing as zero risk but this is the goal, through the use of strong measures to manage any land conflicts before the LRLC or occurring under the LRLC.
- Loss of some land rights resulting from the certification process (women's' rights or the rights of any socially vulnerable individuals, secondary land rights, absence of owners because of the crises or economic challenges, leading households away from their home *collines*) ➔ (a) ensure that the CLSs and the CRCs work in a peaceful context and that the CRCs are representative of the social diversity of the *collines*; (b) the support teams should be attentive and mindful of the social quality of the process, its political impartiality, and the absence of any form of intimidation; (c) need to combine the technical quality control and the social quality control with a specific gender component; and (d) provide intense information and communication on people's respective rights and opportunities, as well as the ongoing process, at the local and national levels.
- Land certification must be considered as a legal land registration system at the commune level. But, there is a risk that after the end of the support from the project, the sustainability of the CLS will not be ensured. The project will work with the NLC Permanent Secretariat to ensure that the data produced at the communal level will feed into a national database and to identify and implement the conditions for the technical and financial sustainability of

CLSs. The land component of the project includes a study on the issues of financial and technical sustainability, including the maintenance of the land information after the first-time certification (continuous registration of land transactions, subdivisions of parcels).

Additional Studies

20. In addition to the points of caution and improvement mentioned earlier, two elements require specific attention and additional studies: (a) the first item is the gender issue under the LRLC and the land certification process; (b) the second point, already mentioned under Part 3 'Rationale for the land component', pertains to land access for the youth and vulnerable groups in general, who suffer from a lack of access to land resources. The question to address is the following: "To what extent, and despite the national context of land scarcity, can the access to land for these vulnerable groups, particularly the youth, be promoted under the project?"

21. Regarding women's land rights, it will be necessary to build on or even go beyond the actions implemented by other projects (notably the Ngozi Land Project supported by the Swiss Cooperation, the land component of the IFAD projects, and land interventions supported by the NGO ZOA and the Dutch Cooperation), to identify all land rights held by Burundian women and to ensure that such rights are adequately considered under the recognition and certification procedures.

22. It should be noted that the current land practices in the *collines*, in terms of succession, are clearly unfavorable to women. In the absence of an inheritance law providing equitable access to men and women to inherited lands (a draft bill has existed for 10 years but is clearly not a priority for the political agenda over the next years), transmission of family lands is governed by custom. A woman is not considered as a successor on the same terms as her brothers but only as a usufructuary. Roughly, (because these practices vary among families, *collines*, or provinces and evolve over time), sisters share a plot of land (*igiseke*), the area of which does not generally exceed the share of a single brother.

23. However, women still have some land rights that should be secured through recognition and land certification operations. These include land rights on lands they bought, property rights resulting from some forms of *igiseke* (minority forms), and usufruct rights resulting from other forms of *igiseke* (majority forms). In addition, nothing prevents a couple, legally married or not and who are in agreement, to establish the land certificate in the name of both spouses. Based on the Individual and Family Code, "Lands acquired through testamentary disposition, housing, and farm operation are part of the conjugal community," "unless proved otherwise through a legal, conventional, or customary provision." In the field, the custom is often to establish the land certificate under the sole name of the husband. However, in some cases, although rarely, a man 'accepts' that the name of his wife is included on the land certificate. Under this project, actions should be taken to encourage such practices.

Figure 11.7. Ongoing Landscape Related Interventions in Isale

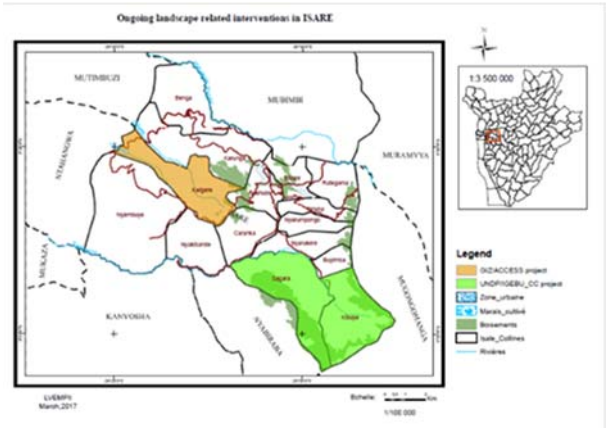
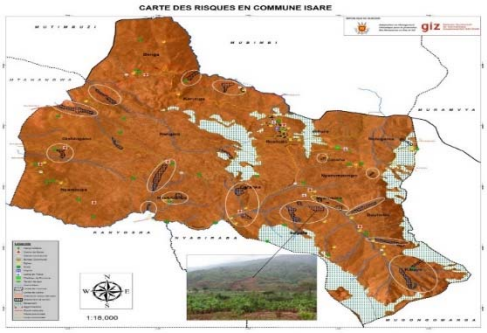


Figure 11.8. Buhinyuza Area Map Before Landscapes Intervention

Figure 11.9. Buhinyuza Area Map Before Landscapes Intervention



Source: IUCN, 2017

ANNEX 12: PROCTECTED AREAS MAP

ANNEX 13: BURUNDI MAP