PROGRAMME ON INNOVATION:
LARGE GRANTS PROJECTS

REQUEST FOR PROJECT FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project must be fully prepared when the request is submitted.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN N7-700
Washington, D.C., 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org

SINGLE COUNTRY/ REGIONAL INNOVATION PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Enhancing resilience to flood and drought through a unique combination of innovative climate adaptation tools, technologies, and practices in Burundi
Country/ Countries:	Burundi
Thematic Focal Area[1]:	Disaster risk reduction and Food security
Type of Implementing Entity:	Regional Implementing Entity
Implementing Entity:	UN Environment Programme (UNEP)
Executing Entities:	Office Burundais pour la Protection de l'Environnement (OBPE)
Amount of Financing Requested:	5,000,000 US Dollars

[1] Thematic areas are: Agriculture, Coastal Zone Management, Disaster risk reduction, Food security, Forests, Human health, Innovative climate finance , Marine and Fisheries, Nature-based solutions and ecosystem based adaptation, Protection and enhancement of cultural heritage, Social innovation, Rural development, Urban adaptation, Water management, Wildfire Management.

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1. Project / Programme Background and Context

1.1 Project Context

1. Burundi is a small, landlocked country with abundant natural resources, especially minerals and hydropower potential, but years of conflict have severely damaged its economic structure and contributed to widespread poverty [2] [3].

2. The country and its people are strongly dependent on climate sensitive economic sectors such as agriculture (mainly rain-fed) and animal husbandry. Agriculture contributes 39.2% to the country's Gross Domestic Product (GDP), occupying almost 94% of the working population[4]. Agriculture exports (coffee, tea, cotton) provide all but a small percentage of export revenues[5].

3. The vulnerable communities and social groups in the Imbo Basin of Burundi are predominantly rural and depend on agriculture for their livelihoods; these include women and youth, family farms, landless laborers and ethnic minorities. With 400 inhabitants per km², the Imbo plain is one of the most densely populated regions in the country. The population is mainly made up of small-scale farmers and pastoralists who rely on rain-fed agriculture and traditional methods of farming. The communities in the area are diverse, consisting of various ethnic groups, with different social and economic backgrounds, cultural traditions, and religious affiliations.

4. Community governance structures in the area are typically based on traditional systems of authority and decision-making per clan and lineage, with roles and responsibilities assigned based on age, gender, and social status. These structures are led by local, often male, chiefs and, often male, elders who are responsible for resolving disputes and maintaining order within the community. Women and young people, in particular, may have limited participation in decision-making processes, due to traditional norms and cultural practices that limit their involvement in public affairs.

5. There are formal governance structures in place, including local government councils and administrative bodies. The local government system in Burundi is divided into four levels: the commune, the province, the region, and the country. Each level is responsible for different aspects of governance, with the commune being the smallest administrative unit and the country being the highest level of government.

6. Community organizational structures and the system of local government in Burundi interact in a number of ways. The traditional community structures play an important role in local governance, particularly at the commune level. Local government officials often work closely with traditional leaders to ensure that policies and programmes are implemented effectively and in line with local customs and traditions. The interaction between traditional community structures and formal local government structures is not always smooth. There can be tensions and disagreements between the two, particularly when it comes to issues of power and

[2] NABC (2013): Burundi Business Fact Sheet

[3] World Bank Climate Change Knowledge Portal, Burundi http://sdwebx.worldbank.org/climateportal/countryprofile/home.cfm?page=country_profile&CCode=BDI

[4] CIA World Factbook (2015). Available via https://www.cia.gov/library/ publications/the-world-factbook/geos/by.html

[5] Burundi Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

authority. There have been instances where local government officials have tried to undermine or ignore traditional structures, which has led to conflicts and disputes.

7. The structure of the agricultural sector in Burundi is characterized by a mix of subsistence farming and larger-scale commercial production of crops, livestock, and fish. The agricultural sector can be described as the series of interrelated activities involved in producing, processing, and distributing agricultural products from farm to table. The different actors in the sector include: (i) farmers, (ii) input providers, (iii) processors, (iv) distributors and (v) retailers. These actors interact in various ways throughout the agricultural sector. For example, input providers work with farmers to provide them with the necessary inputs and technical support to maximize yields and ensure the quality of the crops. Farmers then sell their products to traders, who in turn sell the products to processors. Processors transform the raw materials into value-added products, which are sold to distributors or retailers. Finally, retailers sell the products to end consumers.

8. In Burundi, women make up 56% of the agricultural workforce. Although rural women and men may play complementary roles in farming activities, women tend to play a greater role in natural resource management and ensuring nutrition in the household. Responsibility for climate change adaptation is likely to fall on their shoulders, including finding alternative ways to feed and provide water for their families[6].

9. Burundi's total population in 2022 was 12,889,576 of which 50.3% is female[7]. With an annual growth of 3.1%[8], the country's population is projected to more than double by 2050. With an average density of more than 400 people per km^2, Burundi is the second most densely populated country in Sub-Saharan Africa. Population densities vary across the country[9]. The eastern part of the country has the lowest density, while population densities of 500–2,000 inhabitants per square kilometre occur in the capital, Bujumbura, and the main cities, such as Ngozi and Kayanza in the north, Gitega in the midlands, and Rumonge in the south[10].

10. Ranking in the bottom five countries of the Human Development Index, poverty is widespread, with 90-95% of the population living on less than United States Dollar (USD) 2 per day, particularly in rural areas. Burundi is considered the world's hungriest country with almost 40% of its country in need of food[11]. When coupled with intermittent droughts, food shortages deepen and urban migration increases. Although this situation is present throughout Burundi, it is profound in Cibitoke, Bubanza and Bujumbura Rural provinces[12]. Burundi ranks 5th in the Global Gender Gap analysis for the Sub-Sahara region and 35th on a global level in 2023[13]. This indicates that there have been improvements the last years with regards to Gender Equality in Burundi. The programme aims to build on these positive developments.

[6] Brody et al., 2008, p. 4, in Nabalamba, A., Mubila, M., Alexander, P. (2011): Climate Change, Gender and Development in Africa. African Development Bank

[7] https://data.worldbank.org/indicator/SP.POP.TOTL?end=2022&locations=BI&start=1960&view=chart

[8] World Bank Data – Population growth (2016) http://data.worldbank. org/indicator/SP.POP.GROW/countries

[9] Burundi Ministry of Finance, 2007 in Baramburiye et al. (2013)

[10] Baramburiye et al. (2013)

[11] World Population Review – Burundi. http://worldpopulationreview.com/countries/burundi-population/

[12] These provinces are the targeted provinces of Netherlands bilateral food secuity programme. Embassy of the Kingdom of the Netherlands (EKN) 2013. Multiannual Strategic Plan (2014-2017).

[13] https://www3.weforum.org/docs/WEF_GGGR_2023.pdf

11. Burundi has been characterised as one of the countries in the region that are 'less actively engaged' in climate change adaptation. This is the outcome of national priorities and national capacities[14] and more recently the political crisis which has also resulted in a decline of opportunities for financial and technical support. Burundi has prepared national strategies and polices for climate change and participated in the United Nations Framework Convention on Climate Change (UNFCCC) conferences and agreements.

1.2 Impact Climate Change

12. Globally, Burundi has the lowest per capita Greenhouse Gases (GHG) emissions, ranking 188 out of 188 countries and contributing only 0.01% to global emissions. However, it is highly vulnerable to global climate change. Burundi ranks 165 out of 180 countries in the Notre Dame Global Adaptation Initiative (ND-GAIN) index[15] (2022) with regards to vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. Burundi ranks 160 out of 181 countries in terms of vulnerability i.e. its exposure, sensitivity and ability to adapt to the negative impact of climate change. The country ranks 173 out 192 regarding readiness i.e. its ability to leverage investments and convert them to adaptation actions. These rankings suggest that Burundi is extremely vulnerable and not ready to combat climate change effects.

13. Natural hazards have a destructive impact on the socioeconomic wellbeing of Burundi and its population. Figure 1 reflects the types and distribution of the types of natural hazards the country must deal with.

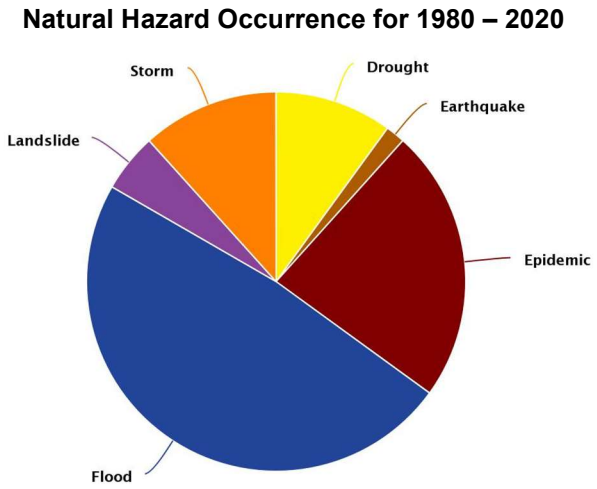


Figure 1: Average Annual Natural Hazard Occurrence for 1980 – 2020[16]

[14] Hove, H.; Echeverría, D.; Parry, J.E. (2011): Review of Current and Planned Adaptation Action: East Africa. Adaptation Partnership / International Institute for Sustainable Development. https://www.iisd.org/pdf/2011/ East_Africa_Adaptation_Action.pdf

[15] The ND-GAIN index summarizes a country's vulnerability to climate change and other global challenges in combination with readiness to improve resilience. https://gain.nd.edu/our-work/country-index/rankings/

[16] https://climateknowledgeportal.worldbank.org/country/burundi/vulnerability

14. Burundi has a history of extreme events that are considered climate related. Historically, various zones experienced frequent famines and destructive hailstorms. The regions struck hardest by such events are (see Figure 2 which is Adapted from Famine Early Warning Systems Network (FEWS NET) and United States Agency for International Development (USAID) (2009): Livelihoods zoning "plus" activity in Burundi):
    - BI01 (Buragane): droughts and erosion[17];
    - BI03 (eastern depressions) north, BI04 (northern depressions) and BI09 (dry eastern plateaus) north:
        - frequent and severe droughts and famines (several per decade) – in BI04 combined with regression of lake levels;
        - since 1999, frequent violent rains, causing erosion, combined with thunder and lightning.
    - BI07 (Imbo plains) north:
        - frequent excessive rains, causing floods and occasionally significant increases in the water level of Lake Tanganyika;
        - frequent rainfall shortages.

Zones most at risk due to climate change

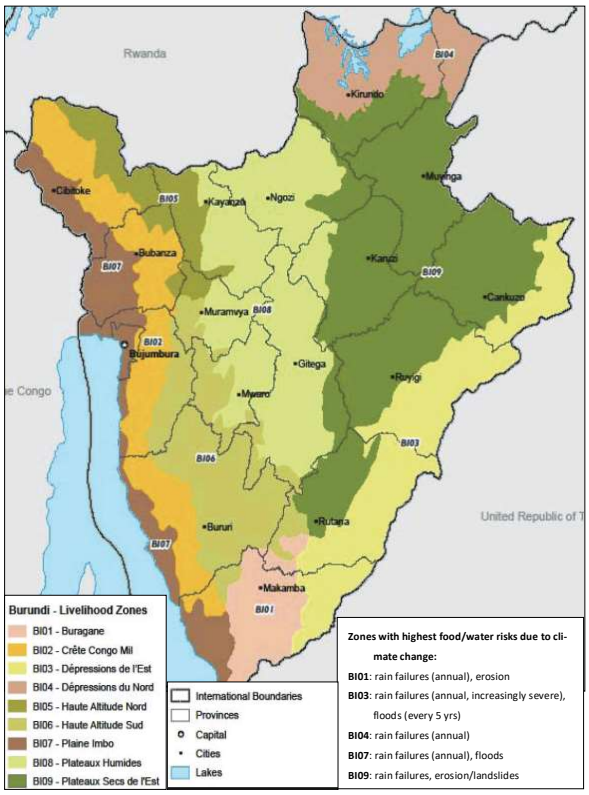


Figure 2: Zones most at risk due to climate change

15. Projections for future changes in temperature due to climate change estimate an increase of 0.4°C per decade[18] and a 1.9°C increase by 2050[19]. Projections suggest the following[20]:
    - A reduction in precipitation is expected for May (end of rainy season) and October (beginning of rainy season).
    - Most models project there will be a slight increase in days with 'heavy' rain by 2100.
    - An increase of drought is expected in the northern part of the country that will cause a decrease in water levels in the northern lakes.
    - Floods are expected to increase in frequency and magnitude in the low-lying areas (e.g. Imbo floodplain).
    - Models project an increase in the number of 'hot' days per year for 2046-2065 and 2081-2100 under the low and high emissions scenarios.

[17] FEWS NET and USAID (2009)

[18] Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

[19] Climate Change Knowledge Portal. Available via: http://sdwebx. worldbank.org/climateportal/countryprofile/home.cfm?page=country_profile&CCode=BDI&ThisTab=ClimateFuture

[20] World Bank Climate Change Knowledge Portal, Burundi. http://sdwebx.worldbank.org/climateportal/countryprofile/home.cfm?page=country_profile&CCode=BDI

- Droughts are expected to become more intense and more frequent, occurring between 40 and 60% of the time.

16. Under current climate change trends there will be a significant impact on some of the principal food and commercial crops in Burundi. The main staple crops are bananas, cassava, sweet potatoes, and beans. Maize (a secondary staple crop), beans and sweet potato yields are expected to decrease gradually, with maize yield decreases of 5-25% predicted for the next decades[21]. Rising temperatures and erratic or lower rainfall will have a negative impact on Burundi's primary exports of coffee and tea, which account for 90% of foreign exchange earnings[22]. Extreme floods and droughts are estimated to result in a reduction of long-term growth by 2.4% of GDP per year[23].

1.3 Programme Area

17. The programme will be implemented at one or multiple sites within the Imbo Basin. The Imbo Basin is a diverse and complex region with a mix of social, economic, and ecological characteristics. Understanding these features is essential for designing effective interventions to enhance resilience to floods and droughts, promote sustainable economic development, and protect the basin's ecosystems. Key features of the basin are:
    - Social structures: The population of the Imbo Basin is largely rural, with many small villages and farming communities scattered throughout the region. The majority of the population belongs to the Hutu ethnic group, with smaller numbers of Tutsi and Twa. Traditional social structures such as extended families and clan-based systems remain important, although there has been significant change in recent years due to factors such as urbanization, migration, and education. Burundi has embedded gender equality in the post-conflict constitution and this has improved women's access to public decision-making. Gender is increasingly being mainstreamed in other projects initiated by the government. There are signs that perceptions are shifting and that women leaders are accepted despite historically patriarchal attitudes and a low value placed on women's roles outside the home.[24] That's an important reason why Burundi moved from 89th in the Global Gender Gap index in 2011 to the 35th place in 2023.
    - Economic activities and sectors: Agriculture is the main economic activity in the Imbo Basin, with most people engaged in subsistence farming of crops such as maize, beans, and cassava. Livestock rearing is also important, particularly for the production of milk and meat. Other key economic sectors in the region include trade, transportation, and services such as education and healthcare.
    - Basin ecosystem: The Imbo Basin is home to a range of ecosystems, including wetlands, grasslands, and forests. The basin is characterized by a tropical climate, with rainy seasons from October to May and a dry season from June to September. The region is home to a variety of plant and animal species, including many endemic to the area. The basin is also

[21] Baramburiye et al. (2013)

[22] Ross, P (2015) Climate Change Effects On Coffee Production: How Hotter Weather Is Killing The Global Arabica Bean Market http://www.ibtimes.com/climate-change-effects-coffee-production- how-hotter-weather-killing-global-arabica-1905151

[23] DFID (2011): The economic impacts of climate change in Burundi. http://weadapt.org/knowledge-base/economics-of-adaptation/economics-of-adaptation-burundi

[24] https://www.undp.org/sites/g/files/zskgke326/files/publications/BurundiFinal%20-%20HiRes.pdf

an important source of water for irrigation and other uses, and is home to a range of water-dependent economic activities such as fishing and brick-making.

18. The Imbo Basin covers the Cibitoke, Bubanza and Bujumbura Rural and Bujumbura Mairie Provinces (see figure 3). During the feasibility study, different sites within these four provinces shall be assessed to ultimately select one or multiple sites to implement the adaptation measures. The number and size of project sites depend on the available budget. These four provinces have been selected considering that these are most vulnerable and prone to flooding and drought based on the following criteria:
    - In terms of the environmental conditions, the sites experience high rainfall variability with increasing frequency and intensity of flood and drought occurrences and high environmental degradation (focusing on vegetation and soil degradation as well as degradation and deterioration of water resources such as streams and rivers).
    - Communities inhabiting such sites are also food insecure characterized by recurrent famine and a shortage of food. There is high dependence on the rain-fed agriculture especially high dependence of farmers and pastoralists on crop and livestock farming.
    - Socially, there are many vulnerable members among the smallholder farmers and pastoralists especially women, children, youth, disabled and elderly by gender. Low-income levels of the population/high poverty levels in such sites therein are known and reported. Women are impacted more by floods compared to men resulting in: displacements, health risks, increased risks of violence, difficulties in accessing relief resources, and disruptions to their daily routines and caregiving responsibilities.
    - Economically, smallholder farmers and pastoralists have limited options in terms of the potential alternative sources of livelihoods and income.

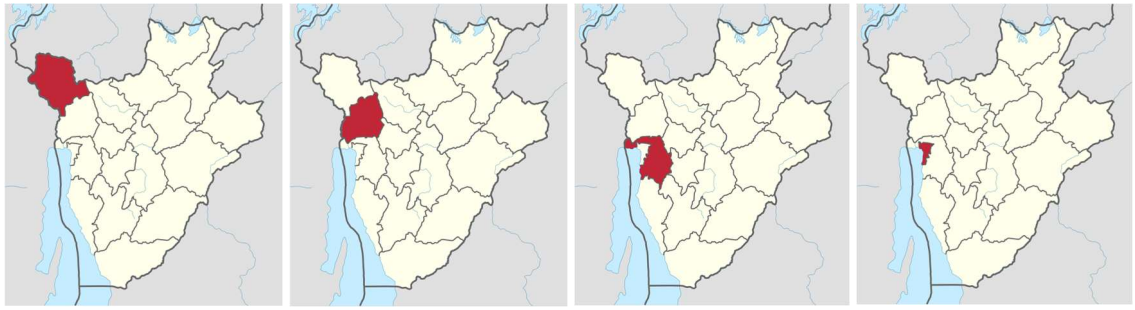


Figure 3: Cibitoke, Bubanza, Bujumbura Rural and Bujumbura Mairie Province

Cibitoke Province. Cibitoke Province is one of the 18 provinces of Republic of Burundi with a population of 491,000 people. Cibitoke Province has an elevation of 1,433 metres and is situated nearby to Nyamuhunba, and northeast of Rubura. The exact geographical coordinates: Latitude in decimal degrees -2.88333, Latitude in degrees, minutes, and seconds 2° 53' 60" South, Longitude in decimal degrees 29.25 and Longitude in degrees, minutes, and seconds 29° 15' East.

Bubanza Province. Bubanza is one of the 18 provinces of Burundi with a population of 354,000 people. Bubanza Province has an elevation of 909 metres and is situated east of Gahongore, and northeast of Cona. The exact geographical coordinates are: Latitude in

decimal degrees -3.11667, Latitude in degrees, minutes, and seconds 3° 7' 0" South, Longitude in decimal degrees 29.4 and Longitude in degrees, minutes, and seconds 29° 24' East.

Bujumbura Rural Province. Bujumbura Rural Province is one of the 18 provinces of Burundi with a population of 556,000 people. The province surrounds the former national capital Bujumbura. The province is 1792 m above sea-level. The provincial capital is Isale. The exact geographical coordinates are: Latitude in decimal degrees -3.4627, Latitude in degrees, minutes, and seconds 3° 28' 46" South, Longitude in decimal degrees 29.46259 and Longitude in degrees, minutes, and seconds 29° 28' 45" East.

Bujumbura Mairie Province. Bujumbura Mairie Province is one of the eighteen provinces of Burundi with a population of 800,000 people. It consists entirely of the city of Bujumbura, Burundi's former capital. The province is 780 m above sea-level. Exact geographical coordinates: Latitude in decimal degrees - -3.3802, Latitude in degrees, minutes, and seconds 3° 23' 49" South, Longitude in decimal degrees 29.3547 and Longitude in degrees, minutes, and seconds 29° 21' 17" East.

19. The programme shall identify the precise location(s) of the implementation and include these in the full proposal. Identifying the precise project sites allows for the programme to identify measures to adhere to the Environmental and Social Policy (ESP) and the Gender Policy (GP) of the Adaptation Fund (AF). The aim is to analyse environmental and social risks for each activity and avoid any unidentified sub-projects (USPs)[25] when submitting the full proposal.

20. The selection of the location(s) also depends on the potential added value of the programme. It is assumed that significant value can be added to the agricultural value chain in the region seeing as the majority of the population has a job in related sectors. The agricultural value chain in the Imbo Basin involves multiple stages including input supply, production, post-harvest handling, processing, and marketing of agricultural products. Inputs such as seeds, fertilizers, and pesticides are supplied to farmers who then produce crops and livestock. The post-harvest handling stage involves activities such as storage, transportation, and processing of agricultural products before they reach the market. The final stage involves marketing of the products to consumers. The crop types that the farmers produce in the programme area, which lie at the heart of the agricultural value chain, are subsistence crops and commercial crops.

21. Subsistence agriculture is the primary form of agriculture, particularly in rural areas, where the majority of the population resides. Farmers in Burundi mainly produce crops such as cassava, beans, maize, rice, sweet potato, sorghum, yam, pineapple and bananas for their consumption and for sale at local markets. Women play a critical role in subsistence agriculture, providing most of the labor required for planting, harvesting, and processing crops. Commercial agriculture is also practiced in the Imbo Basin where cash crops such as coffee, tea, and cotton are grown for export. These crops are grown on larger plantations and require significant investment in inputs such as fertilizers, pesticides, and labor to produce high-quality crops.

[25] Guidance on USPs can be found here: https://www.adaptation-fund.org/wp-content/uploads/2022/10/PPRC.30.54-Updated-guidance-on-USPs-with-Annex.pdf

22. The land tenure system in Burundi is mainly customary, with land allocated according to clan or family lines and tends to be biased towards male ownership. Land is often communally owned and is passed down from generation to generation. While the government has attempted to implement land reform measures, including formalizing land tenure, the customary land tenure system remains prevalent.

23. The average size of landholdings varies significantly, with most, often male, smallholder farmers owning less than a hectare of land. Large plantations owned by multinational companies or wealthy individuals also exist, although they are relatively small in number. Access to land is a significant issue for farmers, particularly those in densely populated areas, as land is scarce, and competition for land is high in the Imbo Basin.

24. The current situation in the programme area with regards to the agricultural value chain is characterized by various challenges. Floods and droughts both have significant negative impacts on agricultural production in the target area of the programme. Floods damage crops, destroy infrastructure, and lead to soil erosion, while droughts cause crop failures, reduce soil fertility, and limit access to water for irrigation. Based on the agricultural value chain analysis in the programme area, some of the identified gaps include:
    i. Vulnerability to climate change impacts: The programme area is vulnerable to the impacts of climate change, particularly floods and droughts. This has resulted in low agricultural productivity and income for farmers.
    ii. Limited access to water: There is limited access to water for agricultural production, particularly during the dry season. This has led to low crop yields and poor-quality produce, resulting in food insecurity and low income for farmers. Agricultural production is therefore unable to meet the demand for local consumption let alone export.
    iii. Poor storage and post-harvest handling: Farmers in the programme area lack access to proper storage facilities and post-harvest handling techniques, leading to high post-harvest losses and poor quality of produce. This has resulted in low income for farmers.
    iv. Private sector is not mature: The absence of a mature private sector in the agricultural sector leads to a lack of investment, limited access to technology and inputs, and limited market opportunities, which hinder the growth and development of the agricultural sector.
    v. Limited market access: Farmers in the programme area face limited market access due to poor infrastructure, inadequate transportation, and lack of market information. This has led to low prices for their produce and limited income for farmers.
    vi. Land ownership: Women in Imbo often face significant challenges in accessing and owning land seeing as land is often passed down through male lineage, resulting in women having limited or no rights to own or inherit land. This can severely impact women's ability to engage in agriculture independently or make decisions about agricultural practices.

25. To address aforementioned gaps, the programme will implement a range of streamlined interventions:
    i. The installation of information technology systems will provide real-time information on weather patterns, and other agricultural information, which will enable farmers to make informed decisions on crop selection, planting, and hazard response.
    ii. The implementation of water-filled mobile flood barriers to protect crops and infrastructure from floods, thereby reducing the risk of crop losses and damage to infrastructure.

iii. The implementation of water storage using the water-filled barrier and irrigation systems will increase the availability and reliability of water for crop production. This will help farmers to diversify their crops, reduce crop losses during dry spells, and increase yields.
iv. The implementation of solar-powered cold storage facilities will help to reduce post-harvest losses, especially for perishable crops, and provide farmers with access to new markets and to markets during the off-season when prices are higher.
v. The promotion of women's land rights and support of female farmers could enable gender-responsive land reforms that prioritize women's land rights and empower them to participate in decision-making related to land and agriculture.

Overall, these interventions will contribute to improving the efficiency of the agricultural value chain, increase productivity and income, improve the resilience of smallholder farmers and pastoralists to climate change and improve gender equality. The interventions enable cultivation of crops during three seasons instead of two which will increase agricultural production. The increase in agricultural products will be used for consumption in other parts of the country and for export purposes.

1.4 Upscaling Pilot Project

26. A pilot project was implemented in 2022 that aimed to demonstrate the effectiveness of a water-filled mobile flood barrier to enhance resilience to flood and drought risk. This project was completed successfully and to the satisfaction of local stakeholders, so much so that the President of Burundi presented this during Conference of the Parties (COP)27 in Egypt. Due to its success, it was decided to scale up this technology in Burundi to increase the realization of flood and drought Adaptation Benefits (ABs). It was furthermore decided to expand not only the regional scope but also the scope of the adaptation measures to mitigate flood and drought risks. An initial unique portfolio of innovative solutions has been designed centred around the water-filled mobile flood barrier.

27. The proposed programme builds upon the knowledge and experience from the pilot project by engaging many of the same stakeholders such as: (i) ministries, (ii) communities, (iii) farmers, (iv) hydrologists, (v) a financial institution, (vi) flood and drought consultants, and (vii) a local Non-Governmental Organisation (NGO). Lessons learned from the pilot project shall be taken into consideration in the proposal; the key lessons learned from different perspectives are included in Table A in Annex 2.

2. Programme Objectives

28. The overall goal of the programme is to increase the resilience of people and institutions in Burundi to (climate change-induced) flood and drought events through the implementation of a unique combination of innovative adaptation technologies supported by information technology.

29. The project aims to consolidate synergies and adopt innovative and resilient flood drought management actions from selected regions in Burundi. The overall goal of the project translates into the following key objectives:
i. Implementation of information framework and services, to garner insight in weather-related data to improve analyses and decision making with regards to flood and drought events.

ii. Implementation of innovative adaptation tools, technologies, and practices to prevent flooding and enhance resilience to drought by harnessing water for irrigation purposes.
iii. Strengthening and improving the capacity of key stakeholders in flood and drought risk management at regional, national, and local levels to undertake innovative adaptation actions that reinforce their resilience to flood and drought events.
iv. Support existing channels and networks or develop new ones for flood and drought information generation and dissemination at national and sub-national level.

3. Programme Components and Financing

Table 1: Budget summary

Programme Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
1. Planning flood and drought information technology and services.	1.1: Increased usage of effective information technology by stakeholders.	1.1.1: Efficient and effective flood and drought information technology and services implemented.	Burundi	400,000
		1.1.2: Flood and drought management plans established at national and sub-national level.	Burundi	200,000
2. Implementing innovative flood and drought adaptation tools, technologies, and practices.	2.1: Increased uptake and usage of innovative flood adaptation tools, technologies and practices.	2.1.1: Flood adaptation tools, technologies and practices designed.	Burundi	390,000
		2.1.2: Innovative water-filled mobile flood prevention structures constructed.	Burundi	1,650,000
	2.2: Increased uptake and usage of innovative drought adaptation tools, technologies and practices.	2.2.1: Drought adaptation tools, technologies and practices designed.	Burundi	350,000
		2.2.2: Drought resistant agriculture practiced.	Burundi	1,100,000
3. Enhancing knowledge management, awareness creation and information sharing on flood and drought risks.	3.1: Strengthened awareness and ownership of flood and drought adaptation and climate risk reduction processes at local level.	3.1.1: Good practices and lessons on flood and drought management documented and disseminated.	Burundi	80,514
4. Activities budget				4,170,514
6. Programme Execution cost (9.5%)				437,786
7. Total Programme Cost				4,608,300
8. Programme Cycle Management Fee charged by the Implementing Entity (8.5%)				391,700
Amount of Financing Requested				5,000,000

5. Projected Calendar

Table 2: Programme calendar

Milestones	Expected Dates
Start of Programme Implementation	June 2024
Mid-term Review (if planned)	January 2026
Programme Closing	June 2027
Terminal Evaluation	January 2028

PART II: PROGRAMME JUSTIFICATION

A. Programme Components

COMPONENT 1. Planning flood and drought information technology and services.

30. Effective flood and drought risk management decisions rely on accurate information, which requires reliable and timely information technology (soft- and hardware) and weather-related data. Information technology and data are the most important assets that people, and institutions can access to analyse and implement flood and drought resilient actions. People and institutions in Burundi are currently constrained in accessing flood and drought information, which limits their ability to respond or deal with flood and drought risks effectively. The lack of effective resilient measures or an adequate response to flood and drought events limit the ability to prevent: (i) crop failures, (ii) pasture losses, (iii) the death of livestock, (iv) soil degradation, (v) conflicts, (vi) migration, and (vii) food and water insecurity.

31. The first component of the programme will focus on implementing and upgrading flood and drought information technology and weather-related data. This component conducts baseline studies and assessments to understand the status of the existing information technology and data to manage flood and drought risks. The programme shall recommend improvements of the information technology to support flood and drought interventions. This component furthermore establishes institutional linkages to share flood and drought information. Flood and drought related information shall be made accessible to relevant people and institutions.

32. This component is aligned with outcomes 1, 3 and 8 of the AF Strategic Results Framework (SRF). Component one helps generate relevant threat and hazard information and ensures dissemination to stakeholders with strengthened capacity and improved information-driven adaptive practices.

33. The activities of the proposed programme facilitate people and institutions to generate and process flood and drought information to enhance knowledge on flood and drought risk management. The specific activities of this component are highlighted under outcomes 1.1 and 1.2 and outputs 1.1.1, 1.1.2, 1.2.1 and 1.2.2. The Theory of Change (ToC) in Annex 1 refers to the outcomes and outputs and the solution tree in Annex 1 demonstrates the pathways / sequencing of events that will lead up to the realisation of the goal and the anticipated benefits.

Outcome 1.1: Increased usage of effective information technology by stakeholders.

34. Concrete effective and efficient innovative information technology will be implemented by installing and upgrading (i) weather monitoring equipment, (ii) an information architecture and (iii) information services such as weather monitoring and analysis tools. Furthermore, weather-related data shall be collected and stored to analyse and response to flood and drought risks. The installed and upgraded information technology and services enable timely and accurate

communication of flood and drought events as well designing effective flood and drought resilient tools, technologies, and practices.

35. The operation and maintenance of the information technology and data shall be standardised and centralised at regional and (inter)national level. There will be an alignment between people and institutions at national and subnational level. Information technology is supported by the Information Technology (IT)-supplier, Nelen & Schuurmans (N&S), who was also involved in the pilot project and with whom there will be service agreements. N&S is a reputable water consultancy and IT-company based in the Netherlands. Capacity building will be conducted by N&S to ensure stakeholders can operate and maintain information technology and benefit the most from information services. The detailed capacity building plan to use information technology, services and data for flood and drought risk management in Burundi involves the following steps:
    i. Conduct an initial assessment of the current level of capacity of the local organizations (e.g the local hydrology department and the flood response team) involved in the programme. This involves surveys, interviews, and workshops.
    ii. Based on the assessment, develop a detailed training plan that includes the objectives, content, and delivery methods for each training session. The plan will be tailored to the specific needs and capacity of the local organizations and individuals.
    iii. Provide training on data management, including data collection, data storage, data analysis, and data visualization.
    iv. Provide training on the specific technology tools being used for flood and drought risk management. This includes training on software applications (e.g., 3Di hydrodynamic modelling software), hardware devices, and sensors.
    v. Provide training on how to interpret data and use it for decision-making. This involves training on how to analyse data to identify trends, develop early warning systems, and develop risk management strategies.
    vi. Regularly monitor and evaluate the training to ensure that it is effective and meeting the needs of the local organizations and individuals. This involves conducting post-training surveys and interviews to assess the impact of the training on knowledge and skills.
    vii. Provide ongoing support to the local organizations and individuals to help them apply their new knowledge and skills in practice. This involves providing technical support, troubleshooting, and mentoring.
    viii. Develop a plan for ensuring the long-term sustainability of the capacity building efforts. This involves developing local capacity to provide ongoing training and support and developing a plan for financing and maintaining the technology and data management system.

Output 1.1.1: Efficient and effective flood and drought information technology and services implemented.

36. There are many areas within the Imbo Basin where people are impacted by flood and drought hazards due to changing weather patterns caused by climate change. It is imperative that people living in these areas understand the risks and take preventive and repressive measures to mitigate flood and drought risks. People can take efficient and effective measures when they have access to timely and reliable information on flood and drought threats.

37. Through the proposed programme, information technology and supporting data will be implemented within the Imbo Basin, at specific project sites that shall be selected during the

feasibility study. Beneficiaries such as community members, farmers, pastoralists shall have improved access to a tailored flood and drought information products/system. This access to information allows stakeholders to effectively plan and respond to flood and drought events.

38. Accurate weather-related data is needed to develop reliable flood and drought information services. The proposed programme aims to collect as much reliable data as feasible to ensure that stakeholders have access to reliable flood and drought information. The proposed programme and the country will benefit from a data rich environment, which is currently lacking. After conducting a baseline study, a decision will be made on how to enrich available data through new means and sources. It is likely that Light Detection and Ranging (LiDAR) technology will be used to enrich available hydrometeorological data (including analysis of both in-situ and remote-sensed data opportunities). LiDAR data and hydrometeorological data are used for Digital Elevation Models (DEMs) and land use maps. These data are highly valuable when analysing flood and drought risks and designing concrete adaptation measures. A data management system will be established to organise and store data in a data warehouse.

39. The programme aims to strengthen the adaptive capacity of various stakeholder groups at different levels of society to enhance their resilience to (climate change-induced) flood and drought events. Stakeholder groups include: (i) national and sub-national governments, (ii) disaster management authorities, (iii) smallholder farmers, (iv) pastoralists and (v) vulnerable stakeholder groups in particular (e.g. women and children). The proposed programme shall establish a common understanding of stakeholders' needs. The programme shall furthermore strengthen stakeholders' capacity to manage flood and drought risks.

40. The programme shall establish a framework to manage information technology, information services, and (Hydrometeorological and LiDAR) data to support flood and drought risk management; this framework involves the following:

    i. The programme shall develop a clear plan for how data will be managed, stored, and shared. This plan will include data security protocols, data backups, and data privacy considerations. The plan will also take into account the fact that the providers of the technology are located outside the country.
    ii. The programme shall build the capacity of local organizations (e.g the local hydrology department and the flood response team) to manage and analyze data. This involves training on data management, data analysis, and data visualization tools (hydrodynamic modelling). It will also involve developing / upgrading local data management infrastructure, such as data centers and data repositories.
    iii. The programme shall establish a strong relationship with the technology providers to ensure that they understand the programme's needs and requirements. This involves regular communication, feedback mechanisms, and joint problem-solving. The programme will also establish roles and responsibilities for the technology providers and local stakeholders.
    iv. The programme shall ensure that the data management system is sustainable over the long term. This involves developing a plan for financing and maintaining the system, as well as building local capacity to ensure that the system can be operated and maintained locally.
    v. The information technology requires continuous maintenance and enhancements to realise a certain level of quality of flood and drought information. A feedback mechanism ensures that experiences with the information technology is shared amongst stakeholders. In turn,

this enables insight in the extent to which information technology meets expectations and whether improvements/changes are required. The feedback mechanism is essential to ensure active and reliable usage of flood and drought information.

vi. Maintaining and operating information technology and disclosing information requires close collaboration between different departments at national and subnational level and with international suppliers. It is imperative that the roles and responsibilities are clear and agreed upon with regards to information management.

Activities

- Activity 1.1.1.1: Assess the availability of data to support a tailored flood and drought information products/system.
- Activity 1.1.1.2: Perform gap analyses between current status of flood and drought information technology with the desired information technology on national level and the target regions.
- Activity 1.1.1.23 Develop implementation plans to construct/upgrade the flood and drought information technology.
- Activity 1.1.1.4: Develop/upgrade flood and drought information technology at national and regional levels.
- Activity 1.1.1.5: Setup/renovate flood and drought resilience centers incl. data warehousing.
- Activity 1.1.1.6: Support/equip project beneficiaries to access flood and drought information (e.g. apps, brochure, text message, radio etc.).
- Activity 1.1.1.7: Support regular stakeholder flood and drought information feedback platforms for stakeholders such as farmers and pastoralists.
- Activity 1.1.1.8: Develop an emergency response plan for flood and drought disasters at the national, regional, and local levels.

Output 1.1.2: Flood and drought management plans (FDMPs) integrating climate change aspects and adaptation actions are developed.

41. There are multiple plans that cover flood and drought risk management activities for different authorities at national and sub-national level. It is imperative to standardise and centralise flood and drought management plans to enable a common approach to mitigate flood and drought risks with clear roles and responsibilities. Plans shall be disseminated to people and authorities.

42. The current capacity to integrate flood and drought risk management into development plans is inadequate to ensure effective implementation of flood and drought resilient tools, technologies, and practices. Furthermore, the country has limited financial resources for climate investments in the water sector, which hampers effective flood and drought risk management. Inadequate flood and drought risk management leads to adverse impacts for people, especially for vulnerable communities in the selected regions. These shortcomings therefore limit communities' ability to enhance resilience to flood and drought events.

43. The proposed programme follows a participatory approach to ensure ownership with the relevant people and institutions. Flood and drought risk management impacts and requires involvement of various stakeholder groups at different levels of the society. It is imperative that arrangements are made between the different stakeholder groups who are involved in flood and drought risk management activities. These arrangements enable a paradigm shift to realise a sustainable mitigation of flood and drought risks.

44. Agreements between stakeholder groups related to flood and drought risk management shall be centralised, updated, and ratified. These agreements shall define the flood and drought risk management processes and the different roles and responsibilities. The stakeholders must agree on the arrangements to ensure that the risk mitigating solutions are sustainable.

Activities

- Activity 1.1.2.1: Develop/update existing FDMPs at national and sub-national levels integrating climate change elements and adaptation actions.
- Activity 1.1.2.2: Promote and disseminate FDMPs for use by stakeholder groups (e.g. disaster management authorities, farmers and pastoralists).
- Activity 1.1.2.3: Support effective adoption/embedding of FDMPs in governmental policies and practices e.g. by developing bylaws.
- Activity 1.1.2.4: Support Incorporation of flood and drought information into planning and budgeting processes of Burundi.
- Activity 1.1.2.5: Develop/upgrade national and regional flood and drought management multi-sectoral/stakeholder agreements and platforms to coordinate partner efforts. Ensure a periodical review of the agreements and platforms.

COMPONENT 2. Implementing innovative flood and drought adaptation tools, technologies, and practices.

45. Institutions and other stakeholder groups in Burundi have limited access to effective flood and drought tools and technologies which prevents them from taking the necessary actions to prevent damages. The lack of effective flood and drought resilient tools and technologies have a devastating impact on the socio-economic and environmental wellbeing of the country and in particular the sites in scope of the proposed programme.

46. Component two aims to increase resilience of people and institutions by implementing a unique portfolio of innovative flood and drought adaptation tools, technologies, and practices centred around a water-filled mobile flood barrier we call SLAMDAM. SLAMDAM comprises of sustainable dams (40+ lifetime) made of Ethylene Propylene Diene Monomer (EDPM) which is 100% recyclable. SLAMDAM will be positioned to harness flood and rainwater for domestic and irrigation purposes during the dry season. The aim is for the unique portfolio of adaptation measures to be a blueprint for future programmes to enhance resilience to flood and drought.

47. This component is aligned with outcomes 4, 5 and 8 of the AF SRF. Component two implements innovative adaptation practices, tools, and technologies to build and improve physical infrastructure to withstand climate change-induced flood and drought. This component furthermore conserves resources to improve food and water security.

48. The activities for this component are highlighted below under outcomes 2.1 and 2.2 and outputs 2.1.1, 2.1.2, 2.2.1 and 2.2.2. The Theory of Change (ToC) in Annex 1 refers to the outcomes

and outputs and therewith demonstrates the pathways / sequencing of events that will lead up to the realisation of the goal and the anticipated benefits.

Outcome 2.1: Increased uptake and usage of innovative flood adaptation tools, technologies, and practices.

49. Concrete flood resilient tools, technologies and practices will be implemented at the selected locations to mitigate the risk of flooding. The portfolio of measures centre around an innovative water-filled mobile flood barrier. The flood resilient measures that will be implemented are durable and meet local specific requirements to mitigate flood risk effectively for a long period. The proposed programme will promote the usage of the implemented tools and technologies to ensure a large uptake and a paradigm shift.

Output 2.1.1: Flood adaptation tools, technologies and practices designed.

50. The design of the flood resilient measures, including the water-filled mobile flood barrier, is based on flood risk analyses. Hydrodynamic modelling software in combination with local expertise gives insight in the flood risks. A Flood Intelligence Service (FIS) gives insight in how best to manage flood risks and what the anticipated Adaptation Benefits (ABs) are from implementing the adaptation measures.

Activities

- Activity 2.1.1.1: Develop flood scenarios for multiple locations baseline versus benefit scenarios; the latter includes the deployment of a mobile flood barrier to prevent damages.
- Activity 2.1.1.2: Determine the anticipated adaptation benefits from deploying the mobile flood barrier for multiple flood scenarios and select the scenarios to determine the required mobile flood barrier structure.
- Activity 2.1.1.3: Undertake assessment of impact climate change on erosion at the selected areas and to what extent the mobile flood barrier technology can strengthen resilience to erosion.
- Activity 2.1.1.4: Undertake assessment on how to deploy the mobile flood barrier to redirect excess flood water to innovative water harvesting and storage infrastructure.
- Activity 2.1.1.5: Design appropriate mobile flood barrier technologies and supporting equipment/infrastructure to realise the anticipated adaptation benefits from the selected benefit scenarios including the redirecting of the excess flood water.
- Activity 2.1.2.6: Make the area/landscape suitable to ensure accessibility to the location of deployment and suitability to deploy the flood barrier e.g. by levelling the ground surface.
- Activity 2.1.2.7: Conduct flood risk assessments on the agriculture value chain.

Output 2.1.2: Innovative water-filled mobile flood prevention structures constructed.

51. The portfolio of adaptation measures in the proposed programme centre around the water-filled mobile flood barrier. Flood risk analyses using hydrodynamic modelling software provide insight in the characteristic of the flood events and how the mobile flood barrier can prevent damages in combination with green measures. These analyses will be used to determine the dimensions of the flood barrier and the type of green measures that are suitable for flood prevention. Once the flood risks have been analysed, the mobile flood barrier will be constructed and shipped to

the selected sites. A storage facility and transportation means will be available to store and deploy the flood barrier to mitigate flood risks effectively. The water-filled flood barrier will be deployed either when a threat of flooding has been detected or for a longer period of time e.g. during the entire flood season (see Figure 6). The agreed green measures shall be implemented following the flood risk analysis.

Figure 4: Innovative mobile flood barrier will be implemented

Activities

- Activity 2.1.2.1: Construct appropriate, innovative mobile flood barriers and supporting equipment such as (solar powered) pumps and hoses.
- Activity 2.1.2.2: Construct storage facilities to store the mobile flood barrier.
- Activity 2.1.2.3: Ensure availability of appropriate means of transportation from the storage facility to the location of deployment such as trolleys or cars.
- Activity 2.1.2.4: Promote response practices in case of a flood warning (e.g. seeking shelter, protecting people and assets, recovery planning).
- Activity 2.1.2.5: Train stakeholder groups on how to operate and maintain the flood barrier.

Outcome 2.2: Increased uptake and usage of concrete and innovative drought adaptation actions.

52. Concrete drought resilient tools, technologies and practices will be implemented at the selected locations to mitigate the risk of drought. The water-filled mobile flood barrier, which is used to mitigate flood risk, will also be used to mitigate drought risk. The mobile flood barrier will be used to harness flood-/rainwater in the barrier and in man-made lakes. The drought resilient measures are durable and meet local specific requirements to mitigate drought risk effectively for a long period. The drought resilient tools and technologies are implemented in combination with drought resilient practices to create a paradigm shift.

Output 2.2.1: Drought adaptation tools, technologies and practices designed.

53. The design of the drought resilient measures is based on drought risk analyses. Hydrodynamic modelling analyses in combination with local expertise give insight in the drought risks and how

to mitigate these risks effectively. The design of the drought resilient measures will be included in the drought risk management plans.

Activities

- Activity 2.2.1.1: Develop drought scenarios for multiple locations baseline versus benefit scenarios; the latter includes usage of excess flood water stored in innovative water harvesting and storage infrastructure.
- Activity 2.2.1.2: Determine the anticipated adaptation benefits from drought adaptation intervention technologies for multiple drought scenarios and select the scenarios to determine required adaptation measures and technologies.
- Activity 2.2.1.3: Facilitate farmer and pastoralists associations/cooperatives and other stakeholder groups to generate 22nalyse and share market information.
- Activity 2.2.1.4: Conduct drought risk assessments on the agriculture value chain.
- Activity 2.2.1.5: Undertake assessment on water utilization/potential/availability and develop water management plans in project sites.
- Activity 2.2.1.6: Design drought adaptation measures and technologies including water harvesting facility (e.g. man-made lake), water treatment system, irrigation system.

Output 2.2.2: Drought resistant agriculture practiced.

54. Drought risks in many regions in the Imbo Basin overshadow flood risks. The programme aims to tackle both type of risks using the same innovative technology being a water-filled mobile flood barrier. The water stored in the flood barrier will be used to irrigate land during dry season. In addition, the water-filled mobile flood barrier will be deployed upstream to harness water during a rain or flood event (see Figure 7). The harnessed water will be utilized to improve water security in times of drought.

Figure 5: Water-filled flood barrier will serve as a water harvesting infrastructure

55. The programme shall implement a solar pumping and irrigation systems to utilize harnessed water to irrigate crops in times of drought. The irrigation system will increase crops production and therewith food security throughout the region (see Figure 8).

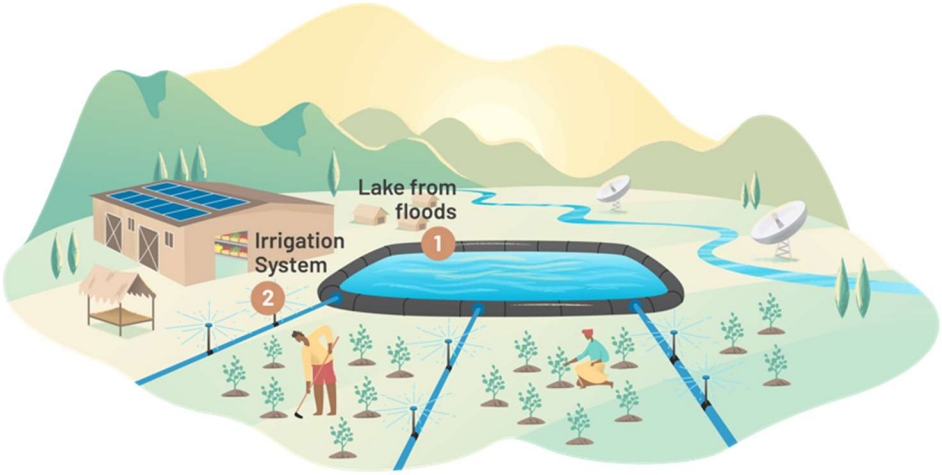


Figure 6: A solar pumping and irrigation system

56. A capacity building plan for the irrigation system shall be designed by Natural Eco Capital based in Nigeria in collaboration with The Trans-African Hydro-Meteorological Observatory (TAHMO) to ensure that farmers and other beneficiaries have the knowledge and skills they need to use the system effectively and sustainably. Both reputable organisations have a solid track record with regards to capacity building in African countries. By providing tailored training and ongoing support, we will maximize the impact of the irrigation system and ensure its long-term sustainability. The capacity building plan contains the following steps:
    i. The programme shall assess the existing knowledge and skills of the farmers and other beneficiaries who will be using the irrigation system. This involves conducting surveys and meetings to identify areas of strength and weakness.
    ii. Based on the results of the needs assessment, the programme shall develop a training curriculum that covers the key topics and skills that the beneficiaries need to know in order to use the irrigation system effectively. This includes topics such as water management, crop selection, and maintenance of the irrigation infrastructure.
    iii. The programme shall identify trainers and facilitators who have the expertise and experience to deliver the training curriculum effectively.
    iv. The programme shall conduct training sessions for the beneficiaries using a variety of methods, such as lectures, group discussions, and hands-on activities. The training will be tailored to the needs and preferences of the beneficiaries.
    v. The programme shall provide ongoing support to the beneficiaries to ensure that they are able to apply the knowledge and skills they have learned. This involves follow-up visits to farms to provide additional training and support, as well as establishing community-based support groups to share knowledge and best practices.
    vi. The programme shall monitor the effectiveness of the capacity building plan by collecting data on the adoption of new practices and behaviours, as well as the impact of the irrigation system on crop yields and other indicators of success. This information will be used to make adjustments to the capacity building plan as needed.

57. The drought resilient technologies will be implemented in combination with drought resilient practices. These practices relate to agricultural activities to grow crops efficiently e.g., by

selecting crops that don't use a significant amount of water. Mitigating drought risks through technologies and practices will result in enhanced food and water security. To further support food security, the proposed programme will install a solar powered cold storage facility to preserve crops and prevent these from getting spoiled. Such a cold storage unit ensures availability of food throughout the year even when it's offseason. Farmers can increase their production to increase earnings and therewith improve their livelihoods.

Activities

- Activity 2.2.2.1: Construct appropriate, innovative water harvesting and storage infrastructure (e.g. man-made lake with EPDM layer or EPDM storage units. Measures/technologies will also be implemented to prevent evaporation of water when it's stored.
- Activity 2.2.2.2: Construct irrigation and water delivery systems (e.g. gravity flow scheme, drip irrigation and solar powered irrigation systems). Furthermore, perform feasibility study to implement water delivery system for long distances e.g. by using pipe lines.
- Activity 2.2.2.3: Train stakeholder groups on how to operate and maintain the irrigation system and the water harvesting infrastructure.
- Activity 2.2.2.4: Construct water treatment process/system to sustain or improve the quality of the stored water to reuse it for irrigation purposes, for livestock or even for human consumption.
- Activity 2.2.2.5: Promote appropriate water and soil conversation measures (e.g. minimal water usage for crops production, soil fertility management.
- Activity 2.2.2.6: Construct a solar powered cold storage to store crops for a longer period to enhance food security during dry season and organise cold storage management.
- Activity 2.2.2.7: Promote fast growing and drought resistant crop varieties.
- Activity 2.2.2.8: Promote climate-smart agricultural practices supported by innovative software/apps.
- Activity 2.2.2.9: Connect farmers with potential buyers and provide market information to enhance market access.

COMPONENT 3. Enhancing knowledge management, awareness creation and information sharing on flood and drought risks.

58. There is a lack of awareness on flood and drought risks and adaptation tools, technologies and practices amongst stakeholder groups including governmental institutions leading to poor planning and responses to flood and drought events resulting in adverse impacts such as low crop and livestock yields leading to food insecurity and low incomes. This component seeks to support knowledge generation, packaging, and dissemination between and across stakeholders in various institutions within the country. The Theory of Change (ToC) in Annex 1 refers to the outcomes and outputs and therewith demonstrates the pathways / sequencing of events that will lead up to the realisation of the goal and the anticipated benefits.

Outcome 3.1: Strengthened awareness and ownership of flood and drought adaptation and climate risk reduction processes at local level.

59. The proposed programme shall organise (i) educational programmes, (ii) capacity building workshops and (iii) training sessions to improve the capacity of people and institutions at

national and sub-national level. The capacity building activities shall be customized for each stakeholder groups. Marginalized and vulnerable groups shall undergo capacity building activities. Workshops, educational programmes, and training sessions shall be provided to key stakeholders at different levels of society.

60. The activities of the proposed programme facilitate people and institutions to (i) generate knowledge on flood and drought risk management, (ii) undertaking study tours, (iii) exchange visits, (iv) documenting lessons learned or best practices and (v) generally facilitating knowledge exchange. The information, lessons learned, best practices and innovative technologies will be documented and shared for the use by various stakeholder groups.

61. Adaptation knowledge products will be prepared and transferred within and among people and institutions. They will focus on the implementation of concrete adaptation interventions that are effective in building resilience to floods and droughts. The knowledge products generated by the proposed programme will be shared via knowledge platforms and forums across, as well as through knowledge-sharing events at the demonstration sites.

62. There shall be a knowledge platform that is a single source of flood and drought knowledge, which accessible to relevant people and institutions. This knowledge platform is used to share knowledge incl. best practices, lessons learned and the realization of (inter)national objectives.

63. This component is aligned with outcomes 2, 3, 6, 7 and 8 of the AF SRF. Component three strengthens institutional capacity and overall awareness to effectively respond to climate flood and drought and to adapt practices to improve livelihoods. This component furthermore improves policies and regulations and strengthens awareness and ownership of flood and drought adaptation and climate risk reduction processes at national and subnational level.

Activities

- Activity 3.1.1.1: Develop capacity building plans and supporting materials/toolkits for national, regional, and local stakeholder groups including governmental organisations.
- Activity 3.1.1.2: Organise visits and learning tours for cross-learning in areas with successful flood and drought management innovations including best water management practices.
- Activity 3.1.1.3: Document and disseminate lessons and best practices from project interventions. These lessons learned and best practices contain recommendations to improve flood and drought adaptation practices.
- Activity 3.1.1.4: Establish framework/platforms to disseminate/share knowledge and information on flood and drought risk management. The aim is to standardise and centralise (single source) flood and drought knowledge and information that is easily accessible to the stakeholders with a clear description of roles and responsibilities to manage knowledge and information.
- Activity 3.1.1.5: Generate and package information dissemination materials on flood and drought adaptation actions and climate change that is easily accessible by the various stakeholder groups. Packaged information should meet requirements international standards

e.g. reporting on realisation of Nationally Determined Contributions (NDCs) or Sustainable Development Goals (SDGs[26]).

- Activity 3.1.1.6: Support national, regional, and local information sharing forums (including farmers and pastoralist associations).
- Activity 3.1.1.7: Establish monitoring and evaluation activities and therewith facilitate empowerment of women, children, and other vulnerable groups on water management.
- Activity 3.1.1.8: An Adaptation Benefits Mechanism (ABM) methodology shall be developed that will be used to measure the anticipated costs and benefits from the interventions.

B. Promotion of new and innovative solutions to flood and drought adaptation

64. Burundi has been experiencing an increase in adverse impacts from drought events due to climate change. Exacerbated drought events impact the socio-economic wellbeing of the country at national and sub-national level. The four selected provinces in the programme experience, on top of drought, an increase in adverse impacts from flood events due to climate change. Burundi is highly dependent on agriculture and pastoralism to support livelihoods and both sectors are climate sensitive considering the dependency on natural resources.

65. Burundi's institutions and communities are amongst the least ready to adapt to climate change and are therefore highly vulnerable to flood and drought events. The ability to recover from flood and drought events is also limited. To reduce the vulnerability of the country, the programme shall implement a unique combination of innovative solutions to enhance resilience to flood and drought risk.

66. Design and implementation of the programme follows a participatory approach by involving different (public and private) stakeholder groups at different levels of society. The programme shall organize workshops, visits, gatherings to co-design the solutions with the various stakeholder groups. By leveraging local expertise during the co-design process, the tools, technologies and practices will be customized to meet local specific requirements.

67. Tailored flood and drought information products/systems that are operated on a national level should also reach stakeholders such as communities. This programme shall establish communication channels between stakeholder groups such as specific apps. The programme shall also establish platforms and periodical meetings to easily share information such as lessons learned between stakeholders.

68. The programme follows a holistic approach towards flood and drought resilience comprising of a unique combination of streamlined innovative tools, technologies, and practices. The information services such as a tailored flood and drought information products/system will be made available for different stakeholder groups with a distinct focus on vulnerable groups such as women and youth. Similarly, (i) the innovative water-filled mobile flood barrier, (ii) water

[26] Alignement with SDG will be implemented according to the new United Nations Sustainable Development Cooperation Framework ("Cooperation Framework" or UNSDCF) guidelines.

harvesting infrastructure and (iii) an innovative irrigation system will be implemented to support stakeholders.

69. Another innovative element of this programme is the implementation of a newly developed solar-powered cold storage facility to extend the shelf life of crops and therewith improve food security and the economy. This is a new way of farming for farmers and community members.

70. Workshops and forums will be organized to promote the usage of the innovative products and services that are part of the holistic approach to enhance resilience to floods and drought. Training and capabilities development will be provided to operate and maintain the innovative climate adaptive interventions.

71. The programme shall promote innovative farming and pastoralism practices to increase resilience to climate change. There are, for example, innovative methods to reduce the required water to a minimum to grow crops. The programme shall guide farmers on what crops to grow and when and where to grow these.

72. A logistical system will be designed to ensure efficient and effective supply of goods such as crops and livestock products. The programme shall establish market linkages between producers and potential buyers by facilitating producers to participate in (i) interviews, (ii) business tours, (iii) supporting producers in trade shows, (iv) business forums etc.

73. The programme shall collaborate with research institutes (e.g. the University of Delft) to promote innovative products and services implemented as part of this project. They will be encouraged to participate and write a scientific paper on this programme. The programme shall use the network of the research institutes to promote the innovative flood and drought resilient measures. Various universities in The Netherlands for example are known to be actively involved in project in the water and agriculture sector.

C. Rollout of successful innovative adaptation practices, tools, and technologies

74. The programme shall start off by analyzing flood and drought risks as well as the climate adaptation practices, tools and technologies that are currently being used in the country. The selected four provinces will require a more granular analysis.

75. The programme shall intentionally bring gender, accessibility, and inclusion considerations into the design of the programme through a proactive and intentional approach that engages diverse stakeholders and applies inclusive design principles. The approach entails:
    i. Conduct a gender and accessibility analysis: The programme shall first conduct an analysis to understand the gender and accessibility issues that may affect the target population. This analysis includes a gender analysis to identify the different roles, needs, and constraints of women and men, and an accessibility analysis to identify the physical, social, and economic barriers that may limit access for people with disabilities.

ii. Engage diverse stakeholders: The programme shall engage a diverse range of stakeholders, including women, men, people with disabilities, and other marginalized groups, in the design and implementation process.
iii. Ensure participation and representation: The programme ensures that women, men, people with disabilities, and other marginalized groups are actively participating in the programme design and implementation. This will be achieved through targeted outreach and communication, and by creating inclusive spaces for dialogue and decision-making.
iv. Use inclusive design principles: The programme shall use inclusive design principles to ensure that the programme is accessible to people with a range of abilities and needs. This could include designing physical spaces that are accessible to people with disabilities.
v. Monitor and evaluate impact: The programme shall monitor and evaluate the impact on different groups, including women, men, people with disabilities, and other marginalized groups. This will help ensure that the programme is achieving its intended goals, and that it is not inadvertently creating new barriers or inequities.

76. The relevant project teams shall (i) hold workshops, (ii) perform desk research, and (iii) hold interviews to get a better understanding of flood and drought risks. These analyses result in a common understanding of the “as-is” situation regarding current flood and drought resilience tools, technologies, and practices.

77. The relevant project teams shall analyse the desired adaptation tools, technologies, and practices on national and sub-national level. This analysis to conducted through: (i) workshops, (ii) consultations with experts, and (iii) desk research. These analyses result in the “to-be” situation regarding current flood and drought resilience tools, technologies, and practices.

78. The differences between the as-is and to-be situation are the “gaps”. These gaps reflect what is currently missing in the design and execution of tools, technologies, and practices. Workshops will be held to discuss the gaps and determine follow-up actions. Gaps can be closed fully, partially, or not at all. Gaps that cannot be closed fully during this programme require recommendations on how to limit the impact of the gap and how to close it in the future.

79. Plans will be designed to close gaps and improve flood and drought resilience by implementing a unique combination of streamlines innovative tools, technologies, and practices. These plans must be approved by all relevant stakeholders to ensure that the implementation will run smoothly. Workshops will be held for different stakeholder groups in Burundi to give a demonstration of the envisioned adaptation tools, technologies, and practices.

80. The co-design process leads to agreed implementation plans. Design and execution of these plans are established per intervention type i.e.: (i) information technology, (ii) technical/physical interventions and (iii) capacity building and knowledge management.

81. There is an overarching programme board that communicates the blueprint/vision of the programme and ensures there is alignment between the different projects. The programme board monitors the progress of the design and execution of the plans must authorize any major changes from the agreed plans. Each project will have its own project board to steer the project in the right direction by monitoring progress and authorizing minor deviations from the original plan in terms of time, quality, and costs. It is imperative to include staff in the project teams who

have the right capabilities to design and execute the agreed plans. A key role in each project team is that of a local focal point who is well known with and respected by various stakeholder groups at different levels of society in the country.

82. To ensure that adaptation tools, technologies, and practices are rolled out successfully, the programme shall establish a Monitoring and Evaluation (M&E) framework. M&E activities will be executed to ensure that the interventions are effective and sustainable. An M&E team shall be appointed to periodically keep track of the workings/effectiveness of the implemented interventions. The team shall record and report on deviations from the anticipated results including an analysis on the root cause of said deviations. These analyses include recommendations on how to resolve or build upon deviations. A committee shall be installed to evaluate feedback and decide how to follow-up with the analyses and recommendations.

83. This holistic approach towards flood and drought risk management comprises of a unique combination of streamlined innovative products and services. This unique combination of innovative adaptation tools, technologies and practices can be a blueprint for future programmes in the water sector. Virtually all (developing) countries experience adverse impacts from climate change-induced flood and drought events and they are eager to find a solution.

84. Research shall be done to identify locations/regions in Burundi, and possibly other countries, where this unique holistic approach to flood and drought risk management could potentially be replicated. A stakeholder mapping document will be developed to identify which stakeholders are responsible for enhancing resilience to floods and drought in the identified locations/regions. The programme shall develop decision trees/matrices to evaluate what locations are suitable for the innovative interventions. This tool can be used when deciding to scale-up the unique combination of interventions elsewhere.

D. Economic, social and environmental benefits

85. The programme is designed to realise the most economic, social, and environmental benefits especially for the most vulnerable groups. Based on the programme scope and the pilot project, it is estimated that the programme shall have around 250,000 beneficiaries. These benefits will be aligned with national and international (climate) objectives as included in national adaptation plans and strategies. The expected beneficiaries include farmers, vulnerable communities, households, and individuals who are particularly at risk from the impacts of climate change and natural disasters. To ensure that the benefits of the programme are distributed equitably, it is important to target those who are most vulnerable and in need of support; this includes women, children, people with disabilities, and marginalized groups. The programme ensures equitable distribution of benefits by following these steps:
    i. Conducting a vulnerability assessment to identify the most vulnerable communities and households at the sites.
    ii. Engaging with local communities to ensure that their needs and priorities are reflected in the design and implementation of the programme.
    iii. Developing targeted outreach and communication strategies to ensure that information about the programme and its benefits reaches all members of the community, including those who may be marginalized or excluded.

iv. Designing activities and interventions to specifically target the needs and priorities of vulnerable communities and households. This includes providing training and support for women farmers, or developing technologies that are accessible for people with disabilities.
v. Monitoring and evaluating the programme's impact to ensure that the benefits are being distributed equitably and that the project is achieving its intended goals.

86. A specific flood and drought Adaptation Benefits Mechanism (ABM) methodology will be developed and applied to measure and monitor the anticipated and realised benefits from the interventions. This methodology comprises of a baseline and a monitoring methodology.

87. Measuring the Adaptation Benefits (ABs) is supported by one of the innovative technologies that will be implemented as part of this project, being a newly developed Flood Intelligence Service (FIS) tool. This software calculates the ABs from flood resilient interventions expressed monetary and non-monetary values. The ABM methodology and supporting tools allow to measure and monitor ABs specifically for vulnerable and marginalized groups such as women and youth. In realizing these ABs, the programme remains compliant with the Environmental and Social Policy (ESP) of the Adaptation Fund (AF). Table B in Annex 2 contains an overview of the identified socio-economic and environmental benefits.

Socio-Economic benefits

88. The programme will directly contribute to improving the populations' livelihoods, nation-wide and across the four selected provinces, through innovative approaches and measures and income-generating activities. Preventing damages from flooding and enhancing water security will improve the livelihoods of farmers and pastoralists and by extension other vulnerable groups such as women and youth.

89. Climate change has exacerbated flood and drought events the last decades, however the number of casualties and injuries has decreased significantly. One of main reasons for the decrease in human loss is due to the implementation of a tailored flood and drought information products/system. By implementing a tailored flood and drought information products/system, the programme will reduce the number of casualties and injuries.

90. Promoting smart agriculture practices such as the usage of drought-resistant crops and drought tolerant breeds of livestock will increase production. By aligning production with customer demand, the incomes of farmers and pastoralists will inevitably increase. This will lead an increase in income and to new jobs. An analysis of the economic incentives of farmers and pastoralists to utilize smart agricultural extension services must take into account the social norms and cultural context of the Imbo Basin such as:
i. Cost benefit analysis: Farmers and pastoralists will be more likely to utilize smart agricultural extension services if the benefits outweigh the costs. This includes factors such as increased yields, improved livestock health, or reduced labor requirements.
ii. Trust and credibility: Farmers and pastoralists are more likely to utilize smart agricultural extension services if they trust the information and recommendations provided by the service. It's important to take into account the social norms and cultural context when designing extension services, as this can impact perceptions of trust and credibility.

iii. Social norms and cultural context: The social norms and cultural context may influence the economic incentives of farmers and pastoralists to utilize smart agricultural extension services. For example, if there is a social norm against women owning land or participating in decision-making, women farmers may face barriers to utilizing smart agricultural extension services. The programme shall protect the interests of vulnerable groups.
iv. Access and infrastructure: The economic incentives of farmers and pastoralists to utilize smart agricultural extension services may be influenced by access to infrastructure such as roads and electricity. The lack of infrastructure may be a significant barrier to utilizing extension services.

91. The programme shall explore the possibility to setup local facilities or teams to manufacture/operate/maintain innovative tools and technologies. For example, there is an option to setup a local facility in Burundi to assemble/produce the mobile flood barrier. This would create new jobs and Burundi could serve as an exporting hub in Eastern Africa.

92. Water harvesting infrastructure ensures access to water in times of drought for irrigation purposes and as drinking water livestock. This helps prevent epidemics and other diseases.

93. Flood resilient interventions ensure that there will be less inundated agricultural land. In turn, this limits the risk of waterborne diseases. This will also enhance access to infrastructure such as roads for the population to move to other locations or to visit healthcare facilities or schools.

94. Another benefit from flood and drought resilient interventions is reduced social unrest, conflicts and, migration of community members seeking water and other sources of livelihoods. These interventions will socially improve people's stability and prevent the necessity to migrate to other regions or countries.

95. The programme ensures that the interests of vulnerable groups such as women and youth are at the forefront when designing and implementing the flood and drought resilient solutions. The programme will set targets to ensure that an adequate number of people who represent these vulnerable groups are involved in the design, implementation and execution of the adaptation tools, technologies, and practices.

96. Overall, the planned interventions of the proposed programme provide concrete socio-economic and environmental benefits to ecosystems and populations especially the vulnerable groups including women and youth. Food security will increase on a national scale and in addition the flood and drought information services are aimed to have a national reach and therewith enhancing resilience to climate change nationwide. The selected regions will receive a unique portfolio of flood and drought resilient technologies. The planned interventions will not only make the vulnerable and marginalized groups resilient to flood and drought events, but also provide them with concrete benefits such as (i) food and water security, (ii) reduced damages to land, assets and people and (ii) increase in income and new jobs.

Environmental benefits

97. The holistic approach to strengthen resilience to flood and drought events will have a positive impact on the protection, restoration, and management of the natural ecosystem. The

combination of information technology services with technological interventions will reduce the vulnerability to climate change-induced flood and drought. Enhanced information management and improved flood protection, water harvesting, and irrigation systems will be embedded in contingency plans/emergency plans. The programme shall develop specific contingency plans based on the analysis of the vulnerabilities of ecosystems and populations.

98. The programme shall increase awareness amongst the population and institutions on the necessity and method to protect, restore and manage the environment in a sustainable manner. The country faces many climate challenges and environment-related benefits don't have the highest priority. It is therefore imperative that the programme creates awareness and conveys the message that benefits for the environment and socio-economic benefits are intertwined.

99. The development or improvement of flood and drought risk management plans will give clarity on how resilience is enabled among different stakeholder groups at all levels of society. These plans reflect the processes and roles and responsibilities to manage flood and drought risks. Benefits for the environment will be explicitly included in the plans to ensure that the population and institutions follow-through with their behaviors and practices to realise benefits for the environment and biodiversity.

100. The implementation of physical technologies such as water-filled mobile flood barriers and climate smart agriculture practices will result in concrete benefits for the environment and biodiversity. Flood protection prevents (agricultural) land from being inundated, which causes damages to the environment. Smart agriculture practices ensure that farmers and pastoralists utilize natural resources to limit the impact on the environment and biodiversity.

101. The programme shall enhance water availability for the population, for livestock and to irrigate agricultural land. Water security is essential for a flourishing environment and biodiversity. Efficient use of water ensures there is little waste and increases the ability to meet the demand.

102. The unique combination of innovative flood and drought resilient measures and supporting risk management plans can be a blueprint for other regions/countries to protect, restore and manage the environment. The programme shall specify what the benefits are for the environment. The interventions and their positive impact on the environment and biodiversity will be communicated to stakeholder groups in Burundi and possibly other (neighboring) countries to determine whether other regions can also realise such a positive impact. The programme shall organize webinars, field visits and other means of knowledge sharing and awareness-raising to showcase the environmental benefits. The goal is to spread the usage of the interventions to protect, restore and manage the environment and biodiversity.

103. There are potential risks of negative development or maladaptation associated with the programme, these risks will be mitigated through careful programme design and implementation, risk assessments, and stakeholder engagement. The programme considers the potential risks of negative development or maladaptation such as:
    i. Dependency: The risk that the programme creates a dependency on external support, it may reduce the capacity of beneficiaries to adapt to climate change in the long-term.

ii. Marginalization: The risk that the programme unintentionally excludes certain groups or exacerbates existing social, economic, or environmental inequalities, thereby marginalizing certain individuals or groups such as women or the poorer segments of Burundi.
iii. Environmental degradation: The risk that the programme unintentionally causes environmental degradation, such as soil erosion, thereby reducing the capacity of beneficiaries to adapt to climate change.
iv. Market distortion: The risk that the programme unintentionally creates market distortions or lead to overproduction of certain crops, thereby affecting the livelihoods of farmers who are not beneficiaries of the programme.

104. The programme shall take the necessary actions to mitigate the negative impacts of the interventions in compliance with ESP, Environmental and Social Impact Assessment (ESIA) and the GP of the AF. The programme has developed these actions following consultations with different stakeholder groups.

E. Cost-effectiveness of the proposed project / programme

105. The programme is cost-effective throughout its three components. Reducing the costs to a minimum will increase the likeliness that these innovative products and services will be scaled up, ideally without financial support from donors. An important feature of the innovative adaptation tools, technologies and practices is that these are more cost-effective compared with the (conventional) alternative solutions. Where possible, the cost-effectiveness will be measured and monitored by comparing the financial investments with the ABs using predefined indicators expressed monetary and non-monetary values (see Table C in Annex 2). As part of the feasibility study and programme design phase, the indicators will be expanded upon in agreement with stakeholder groups. The values of the indicators, i.e. targets, shall be defined during the next phases; the indicators shall be linked to the outputs

106. The first component aims to create an enabling environment for climate change adaptation at all layers of society. The approach to enhance the cost-effectiveness of this component is to perform a gap analysis and formulate recommendations to close gaps without excessive spending. The programme aims to realise operational excellence and cost-effectiveness through standardisation and centralisation of information technology (hard- and software), related processes and data sources. Standardisation and centralisation enable clear communications between different stakeholder groups at national and sub-national level; this prevents a waste of time and therefore funds.

107. The second component focuses on cost-effective design and development of flood resilient technologies including the mobile flood barrier. The programme will implement the FIS tool under component one that analyses the ABs from flood resilient solutions. This tool allows a cost-effective design of the flood resilient solutions to realise the most ABs. One advantage of the water-filled mobile flood barrier compared to conventional structural measures is that it can be deployed at different locations and at different points in time. The solution can cover a large area making it a cost-effective solution. Water-filled mobile flood barriers are significantly more durable compared to conventional sandbag systems.

108. An analysis was conducted by members of the University the Delft in The Netherlands to evaluate the cost-effectiveness of the mobile flood barrier compared to the other flood prevention measures such as sandbags. The analysis showed that the return on investment was the fastest with the water-filled flood barrier.

109. Furthermore, the second component aims to enhance cost-effectiveness with the other technologies including (i) the water harvesting structure, (ii) irrigation system and (iii) solar-powered cold storage. A water harvesting structure will be implemented such as a lake to harness flood/rainwater. The structure will be built upstream which is positioned at a higher altitude. The irrigation system takes water from the water harvesting structure to irrigate a large area of land downstream. Gravity enables movement of water through the irrigation system; this is a durable setup that is low in costs. A solar-powered cold storage unit will be installed to store produce in a cooled environment and therewith prevent spoiling of fruits and vegetables. Solar power is significantly more cost-effective compared to usage of generators.

110. The programme takes into account the Operation and Maintenance (O&M) costs of the tools and technologies implemented as part of the first and second component. A financing mechanism shall be put in place to finance O&M costs to ensure long-term benefits from the programme. The financing mechanism will be agreed with public and private stakeholders during the implementation of the programme.

111. One of the lessons learned of the pilot project (see Table A in Annex 2) related to a concern raised by local farmers on how they can independently finance climate investments, including O&M costs. At the same time, the outcome of the pilot project is that agricultural production has doubled since the implementation of the project. The latter implies that increased income and economic growth will be realised with the implementation of the programme. At least part of the O&M costs can be financed by the private sector that benefits financially from this programme.

112. An Adaptation Benefits Mechanism (ABM) methodology shall be developed that will be used to measure the anticipated benefits from the interventions and the anticipated costs. By measuring the anticipated benefits in relation to the anticipated costs, a financing mechanism can be developed to ensure O&M costs are financed by local stakeholders including smallholder farmers. The O&M cost items of the different technologies are described below.

Information hardware (e.g. weather stations)

i. Maintenance and repairs of the hardware components.
ii. Replacement of hardware components as they wear out or become outdated.
iii. Calibration and testing of hardware components to ensure accuracy and reliability.
iv. Data transmission and storage costs, which may include fees for cellular or satellite data plans and cloud storage services.
v. Energy costs associated with powering the hardware components, which may include batteries, solar panels, or other power sources.

Water-filled mobile barrier

i. Transportation costs for moving the barrier to different locations as needed for flood protection and water harvesting.

ii. Installation and removal costs, as well as labor costs for filling the barrier with water and deploying it in the event of a flood.
iii. Maintenance costs, such as regular inspections and cleaning of the barrier, replacing worn-out parts, and fixing any leaks or damage that occur over time.
iv. Storage costs, such as the cost of storing the barrier when it is not in use, which may require a secure storage facility or other specialized infrastructure.

Water-harvesting structure e.g., manufactured lake

i. Maintenance costs for the structure, which may include repairs, upkeep, and inspections.
ii. Electricity costs to operate any pumps or water circulation systems.
iii. Labor costs for any necessary maintenance or repairs.
iv. Monitoring costs to ensure the quality of the water.
v. Chemical costs for water treatment or purification.

Irrigation system

i. Energy costs for pumping water from the source to the fields, although we plan to use gravity by harnessing water upstream and we will use solar pumps.
ii. Labor costs for maintenance and repairs of the system, including replacing worn-out or damaged parts and cleaning the system.
iii. Chemical costs for treating the water and keeping the irrigation system clean.
iv. Water costs, such as fees for water rights or access to water sources; this has yet to be confirmed with the water authority of Burundi.
v. Equipment costs, such as replacing or repairing pipes, valves, and other components.
vi. Monitoring and control system costs, such as sensors and controllers to optimize water use and manage the system remotely.
vii. Infrastructure costs, such as building man-made lake to harness flood-/rainwater and reservoirs or constructing irrigation canals and channels.

Solar-powered cold storage unit

i. Energy costs for running the cold storage unit, which are often significantly lower than for traditional units due to the use of solar power.
ii. Maintenance costs, such as regular inspections and cleaning of the unit, replacing worn-out parts, and fixing any issues that arise.
iii. Battery replacement and maintenance costs. This is optional since the cold storage unit might rely on a battery bank to store the solar energy for use when the sun is not shining.
iv. Monitoring and control system costs, such as sensors and controllers to maintain the desired temperature range and manage the system remotely.
v. Infrastructure costs, such as building a secure structure to house the cold storage unit and installing any necessary plumbing or electrical connections.

113. This programme builds on a proven technologies, the majority of which have already been successfully implemented in Burundi as part of the pilot project in 2022. This programme is de facto a scale-up of a successful project, albeit with a broader product / service scope. Nonetheless, as per CTCN mandate and delivery model, the selection of technology providers would be done through a competitive bidding process aligned with UN procurement rules.Standard power purchase and water tariff structures on the principles of pay as you use

approach could be adopted for the implementation of this project. This would be further developed at proposal preparation stage.

114. The property rights for the hardware part of the technologies (the irrigation system, solar powered cold storage and slamdam) shall be transferred to the community as assets. Clear legal agreements will define the terms of ownership, maintenance, and operational protocols. The programme shall identify the different roles and responsibilities with regards to the technologies.
The provider of the information technology will retain ownership of the systems through a subscription-based system. The communities will have access to the data and information generated through the systems. The provider of the information technology and the communities will establish an agreement outlining the terms of use and access to the information technology systems, including issues related to data ownership, privacy, and security. The programme shall have the agreement reviewed by an independent party / consultant to ensure that the interest of both parties in the agreement are warranted. This agreement will help ensure that the communities have access to the information they need to effectively manage flood and drought risks while also protecting the rights of the information technology provider.
The physical land where this technology will be placed will continue to be owned by the communities or individual property owners.
Attempts will be made to install the technology in government or commune-owned land after due authorization process is completed.
The property rights for the land will remain with the government.
Copyright of any tools or software developed during the implementation of the project would be guided by the United Nations rules.

115. The third component will realise cost-effective knowledge management through the centralisation and standardisation of supporting tools and related processes. It is imperative to share knowledge on flood and drought risks and adaptive measures amongst many different stakeholder groups. Sharing lessons learned will help enhance cost-effectiveness of climate adaptive actions. Standardisation and centralisation of knowledge management enable clear and effective communications between different stakeholder groups at national and sub-national; this prevents a waste of time and therewith funds.

116. The pandemic situation has taught us that projects/programmes can be implemented successfully without excessive traveling between countries. The quality of online/virtual meetings has improved significantly therewith limiting the need to travel frequently between countries. This contributes to the cost-effectiveness of the programme.

117. Lessons learned from past projects confirm that costs can be saved by holding multi-disciplinary field visits at the beginning of the project. This creates a common understanding amongst members of the project organisation with regards to various elements of the project such as the suitability of the different project sites. Having a common understanding at an early stage of the project enables an effective and time-efficient implementation of the project.

118. The programme will also seek synergies and complementarities with ongoing initiatives and programmes having similar objectives whilst avoiding overlaps. Interventions will be

coordinated closely with other relevant ongoing initiatives implemented in the country. Cost-effectiveness will be achieved through synergies and complementarities.

F. Consistency with national or sub-national sustainable development strategies

119. Despite that Burundi has been characterized as one of the countries in the region that are 'less actively engaged' in climate change adaptation, the country has prepared national strategies and polices for climate change and participated in the UNFCCC conferences and agreements.

120. Burundi has ratified (i) the United Nations (UN) Convention on Biological Diversity (CBD) for which it elaborated a Biological Diversity National Strategy and Plan of Action, (ii) the Convention to Combat Desertification (CCD) for which it elaborated a National Plan of Action to Combat Desertification, (iii) the Framework Convention on Climate Change (UNFCCC) and (iv) the Kyoto Protocol. Burundi signed the Paris Agreement in April 2016 and ratified the agreement in January 2018 with it entering into force in February 2018; see Nationally Determined Contributions (NDCs) below. It has prepared two National Communications for the UNFCCC and a National Action Plan for Adaptation (NAPA)[27]. The programme contributes to the following priorities of Burundi's NAPA:

- Install mechanisms to control erosion in sensitive areas.
- Control the river dynamics of watercourses and torrents in Mumirwa, including the city of Bujumbura.
- Popularise short cycle and dryness resistant food crops.
- Popularise rainwater harvesting techniques for agricultural or domestic use
- Establish and protect strategic buffer zones in Lake Tanganyika floodplain and around the lakes of Bugesera.
- Train and inform the decision makers and other partners, including the local communities on the methods of adaptation to climate variability.
- Improve seasonal early warning climate forecasts.

121. In 2012, Burundi finalised its National Climate Change Strategy and Action Plan[28]. Early 2015, Burundi published a report on its progress on activities under the Hyogo framework for action. Three areas were identified as priorities for the future to which FDR1 will contribute:

- Integrate disaster risk reduction into policies and plans for sustainable development.
- Strengthen institutions, mechanisms and capacities to build resilience to hazards.
- Systematically consider risk reduction in emergency preparedness/response/ activities[29].

122. Burundi submitted its First NDC in January 2018 to the UNFCCC[30]. In its NDC Burundi presents itself as being vulnerable to climate change. It projects that climate change affects

[27] Burundi Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

[28] Nile Basin Initiative (2013): Climate Change Strategy. www.nilebasin.org/index.php/media-center/publications/doc_down- load/104-nbi-climate-change-strategy

[29] HFA (2015): Burundi - Rapport national de suivi sur la mise en oeuvre du Cadre d'action de Hyogo (2013-2015) - Interim

[30] The First NDC is the INDC that was submitted to September 2015 prior to the Paris COP

every economic sector in the country but will particularly impact agriculture and hinder the development of hydropower. To successfully adapt to climate change, Burundi's NDC proposes to prioritise actions that reflect the priorities identified in its National Strategy and Action Plan on Climate Change (2012); this programme contributes to many of these priorities:

- Integrated management of climate risk and forecasts over time (by means of probabilities and forward-looking studies) so as to be able to take action in advance.
- Protection of aquatic and land-based ecosystems.
- Coaching of the population to develop their resilience to climate change.
- Development of institutional and operational capacities to coordinate programmes that are resilient to climate change.
- Establishment of functional monitoring and evaluation mechanisms for climate change, as well as knowledge management and information mechanisms.
- Enhancement of data and information management and distribution mechanisms.
- Reinforcement of climate change tracking systems through observations and investigations.
- Strengthening of the information and data communication and exchange system.

123. Burundi has ratified a Technology Needs Assessment (TNA)[31] and a Technology Action Plan (TAP)[32] related to climate adaptation. The TNA states that sectors most vulnerable to climate change agriculture comes first, followed by the water resources, energy, environment, and natural ecosystems sectors. It is for this reason that the Agriculture and Livestock sector and the water resources sector have been selected as priority sectors in the TNA for adaptation to climate change. Three technologies in the Water Resources sector and three technologies in the Agriculture and Livestock sector have been defined which are deemed "high priority" for the country. The high priority technologies in the Water Resources sector center around: (i) monitoring water quantities, (ii) harnessing rainwater and (iii) control of the rain dynamics. The high priority technologies in the Agriculture and Livestock sector center around (i) soil conservation systems, (ii) development of the short cycle rice variety and (iii) community early warning systems. The TAP of Burundi defines the technologies and projects that are being implemented to meet the high priority technical needs. The activities of the proposed programme are fully in line with the high priorities as stipulated in the TNA and the TAP. The programme shall align with the TNA and the TAP and ensure there is no duplication.

124. The programme is aligned with national and relevant sub-national key strategic documents, policy documents and ongoing/planned projects related to climate change adaptation in the water sector. The programme will contribute to achieving national adaptation priorities and corresponding national and international objectives including those formulated in the gender action plans of the UNFCCC, CBD and CDD. Table D in Annex 2 reflects how this programme contributes to and complies with relevant national/regional strategies, plans and programs.

125. As per 2018, only one of the priority areas of the NAPA has been implemented (improve early warning climate forecasts). Others remain unfunded so far, leaving several vulnerable sectors without action on the identified priorities (including agriculture, freshwater and forestry).

[31] https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/e2a748d4d7fb46a886411a2739cf72d7/eb976df133a34e74b758e3e22fd15490.pdf

[32] https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/2f913115be3049faa26a1e1a7facbfe7/3f6fe789960247acbee711dda0cbfd72.pdf

To successfully adapt to climate change, Burundi's NDC proposes to prioritize actions that reflect the priorities identified in its National Strategy and Action Plan on Climate Change (2012)

126. The programme will liaise with owners of Burundi's strategies/programs/plans to establish linkages between objectives, outcomes and outputs. The extent to which this programme contributes to (inter)national objectives, such as the SDGs, will be embedded in the M&E framework. The M&E team is responsible for keeping track of the realization of the project targets and therewith the contribution to Burundi's (sub-)national strategies, plans and programs.

G. Compliance with national technical standards

127. The programme and all members of the programme organisation shall comply with the AF standards and policies such as the ESP and the GP. To ensure the national ownership and sustainability of the outcomes, the programme shall also be implemented in compliance with the (inter)national standards.

128. The programme organisation shall include members/representatives with the right capabilities to ensure compliance with standards such as Environmental Impact Assessments (EIAs). The programme shall conduct a screening of the programme activities and assess their impacts and, depending on the magnitude of the impacts, these will undergo an EIA or review in accordance with EIA procedures and guidelines. Appropriate responses will be formulated and discussed following the outcome of the EIAs.

129. Consultations have been held with various stakeholders to evaluate the technical standards such as (i) the Environmental Assessment Standards, (ii) the Risk and Disaster Management Framework, (iii) the National Early Warning and (iv) the Response Mechanism. Tables E and F in Annex 2 reflect linkages between the standards and the planned activities of the project. In addition, the Safeguard Risk Identification Form (SRIF) by UNEP has been completed to identify potential risks and mitigation measures for any risks related to similar areas as the AF-principles such as "Biodiversity" and "Indigenous People".

130. The ESIA is consistent with Burundi's legal framework, particularly Law No. 1/010 2000 instituting the Burundi Environmental Code and Decree No. 100/22 of 7 October 2010 relating to measures for implementing the Burundi Environmental Code and ESIA procedures. The detailed assessment concluded that the activities proposed by the programme are fully compatible with relevant national standards pertaining to the country's political, legal and technical framework. These activities include data management, water management, disaster risk management, tailored flood and drought information products/system, crops and livestock production and training of target audiences. Controls will be put in place to limit the risk of social or environmental harm.

H. Duplication of the programme with other funding sources

131. The programme has done a study on the completed, ongoing, and planned initiatives in Burundi and to what extent these are complementary or overlapping. The goal is to avoid

duplications and ensure alignment with ongoing and planned initiatives. Various sources containing programmes in Burundi have been studied including (i) the World Bank, (ii) The AF, (iii) the GEF (Global Environment Facility), (iv) the GCF (Green Climate Fund), (v) the GCA (Global Center of Adaptation) and (vi) the AfDB (African Development Bank).

132. Furthermore, stakeholder consultations have been conducted with the sole intention to avoid any potential duplication of efforts, resources, or geographical coverage, and to ensure alignment between ongoing initiatives and this programme.

133. Table G in Annex 2 summarizes the main planned and ongoing initiatives in the same field as this programme i.e. flood and drought risk management in Burundi. The table reflects how these initiatives are aligned with this programme and whether there are duplications.

134. It is imperative to conduct gap analyses at an early stage of the programme to ensure there is no duplication with other programs/funding sources. Any unforeseen duplications will come to light when conducting gap analyses through multi-stakeholder workshops. Table H in Annex 2 provides a mapping of the core interventions and possible duplication with planned, ongoing, and completed programs that ought to be addressed during gap analyses.

135. Overall, the conclusion is that there are planned, ongoing and completed programmes in Burundi to enhance resilience to climate change in the water sector, albeit a limited number of programmes compared to other (developing) countries. Some of these programmes harbor the risk of duplication, especially with regards to (i) flood and drought early warning, (ii) capacity building and (iii) strategic plan and policy development. Further analysis is required for the full proposal on the extent to which the possible duplications impact this programme.

I. Learning and knowledge management

136. The programme has defined actions to ensure that knowledge of an individual or institution reaches the largest number of beneficiaries as quickly as possible. Component four of the programme is fully dedicated to address awareness raising, knowledge management and communication. Whilst this provides the cornerstone for capturing and disseminating lessons learned, other project components directly contribute to knowledge management mechanisms and dissemination of lessons learned from local to national and to international levels.

137. Knowledge pertains to people's experience, analysis, and exchange with regards to the adaptation practices, tools, and technologies as well as the programme itself. The programme shall develop a knowledge management strategy that sets the long-term direction, scope, and objectives that are systematically pursued and achieved through proper resource planning. The strategy shall be gender sensitive and adhere to the following principles:

- Use male and female knowledge products, communication, and public education material developers and reviewers.
- Use gender-sensitive language and gender-balanced images.
- Check context and content by using convincing gender arguments based on reliable sources and qualitative and quantitative data including sex-disaggregated data.
- Refer to (inter-)national policy framework, policies, strategies, and plans, as applicable.

138. The programme identifies three phases during which a certain type of knowledge management activities take place: (i) during the analysis phase, (ii) during the implementation phase and (iii) after implementation. Each phase has a specific objective related to knowledge management that comes with corresponding activities. The objectives are respectively to (i) create a shared understanding on how to improve the current situation, (ii) to optimize the implementation and (iii) to improve upon the implemented adaptation interventions.

139. The programme furthermore ensures that people and institutions actively participate in knowledge management activities. Active participation is encouraged by making easily accessible tooling available that support knowledge management activities. The importance of knowledge management will be addressed on a frequent basis to ensure it is embedded in the programme culture.

140. The programme considers (i) feedback, (ii) learning, and (iii) development cycles as crucial components of the programme to continuously improve the innovation process. It is a mechanism integrated in the programme design and implementation that goes beyond simple dissemination of results or collecting learning. It involves a process of continuous (i) feedback, (ii) reflection, and (iii) adaptation to address emerging challenges and changing contexts.

141. The feedback, learning, and development cycles include regular monitoring and evaluation of programme activities to identify strengths and weaknesses, review and analysis of data to identify patterns and trends, and engagement with stakeholders to solicit feedback and suggestions. The cycles also include a mechanism for documenting and disseminating learning to relevant stakeholders, including programme partners, local communities, and other actors.

142. The development cycles involve a process of continuous improvement of programme activities and innovation to enhance their effectiveness and sustainability. This includes testing and piloting of new ideas, technologies, or approaches to address emerging challenges, and incorporating new learning into programme activities.

143. To ensure that feedback, learning, and development cycles are effective, they will be integrated into the programme design and implementation from the outset. This involves establishing clear objectives and indicators for learning, identifying relevant stakeholders and their information needs, and ensuring that appropriate data collection and analysis tools are in place. Regular communication and collaboration among stakeholders are essential to ensure that the feedback, learning, and development cycles are responsive to emerging challenges and opportunities and that new knowledge and innovations are shared and applied effectively.

146. The knowledge management strategy includes adaptive management and the development of learning objectives and indicators, keep track of experiences gained from the Fund and analyze them periodically both to enrich the global knowledge on climate change adaptation and to accelerate understanding about what kinds of interventions work.

147. The programme shall develop the knowledge management strategy for the full proposal following these steps:
Step 1: Analyze existing knowledge, data, and communication products and media.

Step 2: Design the knowledge management strategy.
Step 3: Knowledge management implementation and monitoring.
Step 4: Evaluate, generate lessons learned, and disseminate.

The different elements of the knowledge management strategy, captured in Table I in Annex 2, determine the most effective actions and knowledge management results most consistent with overall project objectives.

148. The knowledge management strategy guides the programme organisation on which knowledge management activities to conduct. The implementation and monitoring of the knowledge management strategy shall begin at the start of programme. At programme completion, the knowledge management strategy and activities are evaluated along with the rest of the programme.

149. The generated knowledge will be used by the different partners to improve and adjust the implementation of the programme, for discussions and for the design of future projects. This is particularly important given the quality and quantity of knowledge that is expected to be gathered, for the first time, from this programme. This includes knowledge products on the innovative flood and drought adaptation practices, tools, and technologies. Knowledge products shall be accessible and widely disseminated among stakeholders.

J. Consultative process

150. The vulnerable communities and social groups in the Imbo Basin are predominantly rural and depend on agriculture for their livelihoods. With 400 inhabitants per km², the Imbo plain is one of the most densely populated regions in the country. The population is mainly made up of small-scale farmers and pastoralists who rely on rain-fed agriculture and traditional methods of farming. The communities in the area are diverse, consisting of various ethnic groups, with different social and economic backgrounds, cultural traditions, and religious affiliations.

151. Community governance structures in the area are typically based on traditional systems of authority and decision-making per clan and lineage, with roles and responsibilities assigned based on age, gender, and social status. These structures are typically led by local, often male, chiefs and, often male, elders who are responsible for resolving disputes and maintaining order within the community. Women and young people may have limited participation in decision-making processes, due to traditional norms and cultural practices that limit their involvement in public affairs.

152. There are also formal governance structures in place, including local government councils and administrative bodies. The local government system in Burundi is divided into four levels: the commune, the province, the region, and the country. Each level is responsible for different aspects of governance, with the commune being the smallest administrative unit and the country being the highest level of government.

153. Community organizational structures and the system of local government in Burundi interact in several ways. The traditional community structures play an important role in local

governance, particularly at the commune level. Local government officials often work closely with traditional leaders to ensure that policies and programmes are implemented effectively and in line with local customs and traditions. The interaction between traditional community structures and formal local government structures is not always smooth. There can be disagreements between the two, particularly when it comes to issues of power and authority.

154. An initial consultative process has taken place with key stakeholders of the programme. The purpose of the consultation process is to ensure the interests of different stakeholder groups, especially vulnerable groups such as women and children, are incorporated in the design and implementation of the programme. Ultimately, all stakeholders should work towards a shared objective. A report on the outcome of the consultative process is included in Annex 3.

155. The consultation process started off with the identification of the different stakeholder groups whose support is needed or those who have another vested interest in this programme. The identification of these stakeholder groups was done in collaboration with a representative of the Ministry of Environment, Agriculture and Livestock who is the focal point of the AF. Table J in Annex 2 reflects the participants that took part in consultations.

156. All participants in the consultation process were provided with information that gave a high-level description of the programme. A presentation was also given during consultation events such as meetings and workshops. The consultation workshops and meetings aimed to:

- Provide information on the AF and the proposal development processes.
- Inform partners and beneficiary populations about the project scope and objectives.
- Listen to participants' expectations and needs and take them into consideration in the design of the programme.
- Verify information collected from stakeholders and literature through triangulation.
- Define roles and responsibilities and their contribution to the programme.
- Outline specific actions for the most vulnerable groups such as women, and children.

157. The consultation process was conducted at national and sub-national level. Consultations at national level centered around programme execution as well as impact on and alignment with (inter)national plans, policies, and corresponding objectives. The consultations focused on how to govern with regards to climate adaptation tools, technologies, and practices and how to align activities at different levels. Consultations on local level were with the ultimate beneficiaries and centered around the impact of flood and drought events on the selected sites and how the new adaptation interventions can enhance resilience.

158. Preliminary discussions were held with ultimate beneficiaries such as community members and farmers as well as officials working in the areas of hydrology, meteorology, and disaster management to understand the climate context and supporting policy environment as well as most pressing adaptation needs with regards to flood and drought. In addition, discussions were held with officials involved in sponsored climate programmes to get a view of initiatives in the country that ought to be aligned with this programme. The results of the initial consultations, shown in Annex 3, are taken into consideration and shall be reflected in the programme design.

159. To avoid the risk of social exclusion, the programme shall implement several strategies to encourage and involve all communities and social groups in the design and implementation process. These include:
   i. Participatory approach: The programme adopts a participatory approach that engages all stakeholders in the programme design, planning, and implementation process. This helps ensure that the programme meets the needs and priorities of the community and is sensitive to the cultural norms and traditions of the different social groups.
   ii. Capacity building: The programme provides training and capacity building opportunities for all social groups, including women and young people, to build their skills and knowledge in areas such as climate-smart agriculture and water management. This helps increase the participation of marginalized groups in decision-making and programme activities.
   iii. Gender mainstreaming[33]: The programme shall incorporate gender considerations into the programme design, planning, and implementation process to ensure that the needs and priorities of women and men are adequately addressed. This includes activities such as promoting women's control over resources, and involving women in decision-making.
   iv. Community mobilization: The programme shall engage with community leaders and traditional authorities to promote the programme and encourage the participation of all social groups in programme activities. This will be done through community meetings, awareness-raising campaigns, and other outreach activities.
   v. Monitoring and evaluation: The programme shall monitor and evaluate its activities to ensure that they are reaching all social groups and are not inadvertently excluding any vulnerable communities or social groups. This will be done through regular community feedback sessions and surveys.

160. The programme applies a feedback mechanism to allow for stakeholders' views to be heard during programme implementation. The programme will budget specifically for activities aimed at attaining feedback from stakeholder who participated in the consultations. Feedback will be considered during the further implementation of the programme.

K. Drawing on multiple perspectives on innovation.

161. The community-driven programme requires the involvement of various stakeholder groups to garner their perspectives on innovation. A co-design process ensures inclusive participation and continuous engagement of all partners, including buy-in and commitment. These partnerships help generate new solutions and scale those solutions to make progress. Involving all partners in co-designing the goals and scope of a given partnership is a critical step in ensuring its success and ability to create meaningful impact.

162. A co-design process on innovation is applied during the three phases of the programme i.e. (i) before implementation, (ii) during implementation and (iii) after implementation. The co-design process of the programme is an adaptation of the "*P.ACT: Partnership Co-Design Toolkit*"[34]. The co-design process and the establishment of partnerships follows four stages:

[33] Gender mainstreaming is in accordance with code 2a from the UNEP gender marker table i.e. Gender well mainstreamed Gender is reflected in the context, implementation, log frame. The Gender market table is available under Annex 2, table E.
[34] https://d-lab.mit.edu/resources/publications/pact-partnership-co-design-toolkit

i. **Learn stage**: Explore and clarify partners' respective motivations, capabilities and cultures.
ii. **Imagine stage**: Converge on the partnership value proposition, impact, and type of partnership.
iii. **Create stage**: Define the partnership activities, roles, and governance structure.
iv. **Evaluate stage**. Establish the distribution of value and costs and to define the partnership's monitoring metrics.

163. The programme lists the individuals and organizations that form a partnership. These stakeholders in a partnership are categorized as: (i) Customers, (ii) Community, (iii) Partners and (iv) Institutions. Table K in Annex 2 provides an initial overview of the key stakeholders that are part of each partnership in this programme.

164. An expert shall be appointed to oversee the co-design process considering that most of the various stakeholders are unfamiliar with it. The expert works out the different elements of the co-design process, including the establishment of partnerships, and trains participants on their role and responsibilities. The expert will furthermore organize and lead conversations/workshops between partners.

165. By following the approach laid out in this section, the programme has the necessary collaborations planned to allow deployment and future scaling possibilities and risk management for the project. The programme draws on multiple perspectives on innovation from key stakeholders who will form a partnership.

L. Full cost of adaptation justification.

166. The proposed programme components, outcomes and outputs fully align with national and local government/institutional priorities. The programme reduces vulnerabilities of communities in Burundi and vulnerable groups and aligns with the outcomes as stated in the Adaptation Fund results framework. This alignment has resulted in the design of a comprehensive approach in which the different components strengthen each other and in which outputs and activities are expected to fill identified gaps of Burundi’s current climate change response and corresponding institutional capacities.

167. The programme aims to maximize the funding amount for the concrete adaptation component (Component two). Funding allocation to the other (softer) components is required to complement component two and for sustainability and quality assurance of the programme.

168. Additional funding from the Government of The Netherlands will be requested in the form of a grant in-kind. At the time of writing, the application has not started yet however the possibility of co-financing has been discussed with the representatives of the Dutch government. Should a grant in-kind be awarded, the regional scope will be broadened. However, the programme described in this proposal remains a stand-alone programme that can realise its objectives without co-financing.

169. The overall objective of the project is to increase local communities' resilience to climate change through resilient livelihoods and integrated natural resources management. The paradigm shift is to move from a "business as usual" characterized by unsustainable management of natural resources and agriculture practices to climate resilient agriculture and sustainable management of natural resources. The sections below describe how the baseline scenario (business as usual) and the alternative adaptation option under this proposal.

Baseline Scenario

170. An alternative without the proposed AF supported programme is a "business as usual" situation. Floods and droughts continue to have a destructive impact on the socioeconomic wellbeing of Burundi and its population. Under current climate change trends there will be a significant impact on some of the principal food and commercial crops in Burundi. The main staple crops are bananas, cassava, sweet potatoes, and beans. Maize (a secondary staple crop), beans and sweet potato yields are expected to decrease gradually, with maize yield decreases of 5-25% predicted for the next decades[35]. Rising temperatures and erratic or lower rainfall will have a negative impact on Burundi's primary exports of coffee and tea, which account for 90% of foreign exchange earnings[36]. Extreme floods and droughts are estimated to result in a reduction of long-term growth by 2.4% of GDP per year[37].

171. The different project sites across the Cibitoke, Bubanza and Bujumbura Rural and Bujumbura Mairie Provinces are most vulnerable and prone to flooding and drought. Inaction will therefore impact communities in these regions the most.

- The communities at the project sites continue to experience high rainfall variability with increasing frequency and intensity of floods and droughts and environmental degradation.
- Communities inhabiting such sites continue to be food insecure characterized by recurrent famine and a shortage of food.
- There continues to be many vulnerable members among the smallholder farmers and pastoralists especially women, children, youth, disabled and elderly resulting in: displacements, health risks, increased risks of violence, difficulties in accessing relief resources, and disruptions to their daily routines and caregiving responsibilities.
- Smallholder farmers and pastoralists have limited options in terms of the potential alternative sources of livelihoods and income.

Programme with Conventional Adaptation Measures

172. This alternative is to implement a programme that includes conventional measures to enhance resilience to flood and drought not necessarily taking into consideration climate change trends. The proposed programme contains a unique and holistic approach to enhancing resilience to flood and drought. Conventional measures and projects have shortcomings compared to the innovative approach of the proposed programme.

[35] Baramburiye et al. (2013)

[36] Ross, P (2015) Climate Change Effects On Coffee Production: How Hotter Weather Is Killing The Global Arabica Bean Market http://www.ibtimes.com/climate-change-effects-coffee-production- how-hotter-weather-killing-global-arabica-1905151

[37] DFID (2011): The economic impacts of climate change in Burundi. http://weadapt.org/knowledge-base/economics-of-adaptation/economics-of-adaptation-burundi

173. Conventional projects tend not to follow a holistic approach to enhance resilience to flood and/or drought. Such projects limit their activities to certain measures such as a software solution or structural flood preventive measures. Structural flood resilient measures can be expensive and can have a significant impact on the people and the landscape. Such measures don't always have the ability to adapt to changing weather patterns and changing landscape e.g. due to urbanization. In addition, these measures often require high skilled labour to operate and maintain these to ensure effective performance. Measures such as sandbags are not always effective, not in the least part because it takes a long time to deploy these during a flood situation. Nature Based Solutions (NBSs) can be effective but it often takes a long time for these solutions to develop, whereas the need for effective adaptation measures is urgent.

174. Overall, conventional adaptation measures can be expensive, incapable of adapting to changes and ineffective. Furthermore, projects often address only one part of the problem. Inefficiencies arise from not following a holistic approach and streamlining the various measures to enhance resilience to flood and drought.

Implementation Proposed Adaptation Fund Programme

175. The proposed programme follows a holistic and innovative approach to enhance resilience to flood and drought at the project sites. One of the key elements of the programme is the implementation of the innovative water-filled mobile flood barrier we call SLAMDAM. An analysis was made as part of an assignment by members of the University of Delft in The Netherlands to compare this technology with alternative mitigating measures. Criteria have been formulated, inspired by the Organization for Economic Cooperation and Development (OECD) (1992), for evaluation and comparison of international development projects, which are: (i) Relevance, (ii) Effectiveness, (iii) Sustainability, (iv) Efficiency and (v) Impact. The outcome of this analysis is included in Table L in Annex 2.

176. The assignment by the University of Delft members showed that the water-filled flood barrier scored the highest compared to the alternative measures. Note that the analyzed mitigation measures are not necessarily mutually exclusive. The programme aims to leverage alternative mitigation measures, such as a tailored flood and drought information products/system, complementary to the mobile flood barrier.

177. This is the first time a programme will be implemented using this unique combination of innovative products and services. If successful, this programme could serve as a blueprint for future programmes across Burundi and other developing countries to enhance resilience tot both flood and drought. The programme shall explore whether it's advantageous to implement activities in parallel with projects funded from other sources. The precondition in doing so is that the proposed programme shall deliver its outcomes and outputs regardless of the success of the other project(s).

M.Programme sustainability

178. The sustainability of the programme is enabled by a participatory approach promoted throughout all programme activities, which will allow stakeholders such local communities and authorities to build ownership over the project results. The sustainability strategy will be

developed early on during programme implementation to clearly define roles and responsibilities as well as secure funds for sustainability of intervention and maintenance of the technology post-programme.

179. The sustainability of the programme is furthermore enabled by using tools and technologies that are durable. Subsequently, benefits will be realised over a long period of time well after the programme has come to a closure. Specific measures will be taken to ensure the sustainability of the different tools and technologies that will be implemented taking into consideration community structures as described in the introduction of this proposal.

Irrigation system

180. The programme employs the following strategies to ensure the sustainability of the irrigation system in the long term and foster behavioral change from existing practices employed by farmers and pastoralists to continue using sustainable methods in the long-term:

i. Community ownership: The programme shall involve the community in the programme from the start to foster a sense of ownership and responsibility. The community will have a say in the design, installation, and management of the irrigation system.
ii. Training and capacity building: The programme shall provide training and capacity building for farmers and pastoralists on how to use and maintain the irrigation system. This includes training on reparations and how to manage water resources effectively. This training will take place during the course of the programme. The aim is that the beneficiaries are able to operate and maintain the system independently before the end of the programme.
iii. Monitoring and evaluation: The programme shall establish an M&E-system to track the performance of the irrigation system and the progress of behavioral change. This helps to identify and address any problems that arise in a timely manner.
iv. Awareness raising and communication: The programme shall use various communication channels to raise awareness of the benefits of sustainable irrigation practices and encourage behavioral change.

Solar-powered cold storage unit

181. The solar-powered cold storage facilities will be managed, operated, and maintained by the community members (men and women) themselves or by a community-based organization. This will be achieved by providing them with training and capacity building on the technical aspects of the system, such as how to operate and maintain the system, as well as on the business aspects, such as how to market and sell their produce. Additionally, regular inspections and maintenance will be scheduled and provided by a trained technician or a local service provider. The programme shall ensure that the costs associated with maintenance and repairs are affordable and that spare parts and technical support are readily available. The programme will establish a clear ownership and management structure and ensure that the community members, including women, have a sense of ownership over the facility, which will help to ensure its long-term sustainability.

182. In this programme, the ownership and responsibility of maintaining the infrastructure and installations will lie with the local communities or community-based organizations. The programme will provide training to community members, including women, on how to maintain the infrastructure and installations and ensure its sustainability in the long-term. This training will take place during the course of the programme. The aim is that the beneficiaries are able to

operate and maintain the system independently before the end of the programme. However, to ensure the continuation of maintenance, the programme will also establish maintenance agreements with the suppliers. These agreements will outline the responsibilities of both parties and ensure that the necessary support is available when needed. By working collaboratively with the suppliers and local communities, the programme can ensure that the infrastructure and installations will remain functional and meet the needs of the beneficiaries over the long-term.

183. The programme shall define the financing mechanism to finance activities after completion of the programme. At the heart of the mechanism is a specification of the costs of upholding the implemented tools, technologies, and practices as part of this programme. Agreements shall be made with institutions to ensure financial resources are available to support activities such as maintenance costs. An agreed financing mechanism must be in place to ensure sustainability.

184. The vision for the programme is that, ultimately, the maintenance and operating costs of the tools and technologies will be financed by the beneficiaries of the interventions. This means that the increase in food production resulting from the interventions will generate economic growth for the communities, which will in turn provide the funding for the maintenance and operating costs of the infrastructure and services. The programme is designed to empower the communities to become self-sufficient in their agricultural practices and to strengthen their economic resilience over time, thus reducing their dependence on external funding sources. Through this approach, the programme aims to create a sustainable model for agricultural development that will continue to benefit the communities in the long-term.

185. The programme shall provide a minimum of eight training sessions, each a duration of a minimum of three days, and eight capacity building workshops, each a duration of a minimum of three days, evenly divided over the 3.5-year programme lifecycle to change the bahaviour of farmers and pastoralists to ensure sustainable realization of the programme benefits

186. The programme shall establish an M&E framework that defines processes and people to monitor the results from the implemented activities as part of this programme. The programme shall appoint and train an M&E team to monitor and record the realised benefits including behavioural change of farmers and pastoralists. It is imperative that the team comprises of representatives of vulnerable groups such as women and youth..

187. All key areas of sustainability are included in the M&E framework being economic, social, environmental, institutional, and financial. Specific targets are defined for each area and these will be monitored by the M&E team and evaluated by the installed committee.

188. As part of components one and three, the programme shall establish a knowledge sharing process and a feedback mechanism. These activities ensure that throughout the year, stakeholders can share their experience and the performance of the adaptation tools and technologies. It is imperative to share what went well and what not. Other stakeholders can learn from that and can provide guidance on how to improve. A robust and effective knowledge sharing system and feedback mechanism are essential to make further improve flood and drought resilience and therewith enable sustainability of the programme.

189. Ultimately, the programme shall define what the costs are for an AB. In other words, the programme can define what ABs are realised for the financial investment. In turn, this enables scaling up/replicating programme activities in other regions and countries. Reliable ex-ante analyses can be conducted to indicate what ABs can be expected for investments in the programme activities like this programme.

N. Environmental and social impacts and risks

190. The programme recognizes that with similar initiatives in the water sector, there are inherent environmental and social risks that must be analyzed as described in Annex 2, Table M. The programme analyzes these risks in accordance with the Environmental and Social Policy (ESP) and Gender Policy (GP) of the Adaptation Fund. The outcome of the risk analysis clarifies the gender-specific cultural and legal context of the programme.

191. An initial gender analysis has been conducted in the Imbo Basin by interviewing men and women during field visits. In addition, a gender expert was involved in the pilot project to provide insight in the current situation. The gender analysis resulted in the following findings:

i. The analysis identified specific needs and challenges faced by women and men in the area. Women have limited access to land and water resources due to traditional gender roles and social norms.
ii. The analysis sheds a light on the different roles and responsibilities of women and men in relation to the programme activities. Women are responsible for household tasks and childcare, while men may be responsible for crop cultivation or livestock management.
iii. The analysis identified the constraints and opportunities for women and men to participate in programme activities and benefit from them. For example, women face time constraints due to their household responsibilities, while men have more mobility to attend trainings.
iv. Women reported the existence of gender-based violence in households, especially during the harvest period, as some husbands tend to take over production to indulge in alcoholism or sexual vagrancy. This risk must be analysed as part of the ESIA.

192. Based on the findings of the analysis, the programme shall develop gender-responsive strategies to address the identified needs and challenges, promote women's empowerment, and ensure the equitable distribution of programme benefits. Strategies include:

i. Providing training and capacity building specifically targeted towards women, such as disaster management, irrigation management and soil conservation.
ii. Promoting women’s land rights and supporting women farmers to try and improve their access to land and resources.
iii. Ensuring that women are represented in programme decision-making bodies and community organizations, such as flood and drought response teams.
iv. Addressing cultural and social norms that limit women's participation in programme activities, such as gender-based violence and discrimination.
v. Providing gender-sensitive communication materials and outreach activities to ensure that women are aware of programme activities and can participate in them.

The programme has identified potential environmental and social risks that arise from implementing this programme. The screening process considers all potential direct, indirect,

transboundary, and cumulative risks that could result from the proposed programme. The findings of the screening determine the scope of the assessment. The extent and the scale of the assessment will be commensurate with the risks.

193. The programme is classified as a Category B programme meaning that there is the risk of adverse environmental or social impacts due to the construction of the water harvesting infrastructure. The programme shall further analyse all environmental and social risks for the full proposal in an open and transparent manner with appropriate consultation and develop an Environmental and Social Management Plan (ESMP) to ensure that appropriate actions are taken in a timely manner. The full proposal will include a grievance response mechanism.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme management at the regional and national level, including coordination arrangements within countries and among them. Describe how the potential to partner with national institutions, and when possible, national implementing entities (NIEs), has been considered, and included in the management arrangements.

B. Describe the measures for financial and project / programme risk management.

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

E. Include a results framework for the project / programme proposal, including milestones, targets, and indicators.

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)[38]	*Project Objective Indicat*	*Fund Outcome*	*Fund Outcome Indicator*	*Grant Amount (USD)*
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**

[38] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

G. Include a detailed budget with budget notes, broken down by country as applicable, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

H. Include a disbursement schedule with time-bound milestones.

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[39] *Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:*

(Enter Name, Position, Ministry)	Date*: (Month, day, year)*
(Enter Name, Position, Ministry)	Date*: (Month, day, year)*
(Enter Name, Position, Ministry)	Date*: (Month, day, year)*

6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

<table>
<tr><td colspan="2">I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (……list here…..) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</td></tr>
<tr><td colspan="2">

Name & Signature
Implementing Entity Coordinator</td></tr>
<tr><td>Date: (Month, Day, Year)</td><td>Tel. and email:</td></tr>
<tr><td colspan="2">Project Contact Person:</td></tr>
<tr><td colspan="2">Tel. And Email:</td></tr>
</table>

Letter of Endorsement by Government

[Government Letter Head]

[Date of Endorsement Letter]

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for [Title of Project/Programme]

In my capacity as designated authority for the Adaptation Fund in [country], I confirm that the above (select national or regional) project/programme proposal is in accordance with the government's (select national or regional) priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the (select country or region).

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by [implementing entity] and executed by [national or local executing entity].

Sincerely,

[Name of Designated Government Official]
[Position/Title in Government]

Annex 1: Theory of Change of the programme

The Theory of Change (ToC) helps to ensure that the programme is designed, implemented, and evaluated in a thoughtful and strategic way, with a clear understanding of the intended outcomes and the best ways to achieve them. The ToC serves several purposes:

i. Clarify the logic and assumptions behind the programme: The ToC helps to articulate the underlying logic and assumptions of the programme, including the intended outcomes and the causal pathways that are expected to lead to those outcomes. This helps to ensure that all stakeholders have a shared understanding of the programme and its goals.
ii. Identify key enablers and barriers: The ToC helps to identify the key enablers and barriers to achieving the intended outcomes of the programme. This helps to inform decisions about where to focus resources and attention to maximize the chances of success.
iii. Guide monitoring and evaluation: The ToC serves as a roadmap for monitoring and evaluating the programme's progress and impact. By identifying the intended outcomes and the causal pathways that are expected to lead to those outcomes, the ToC helps to identify the most important indicators to track and measure over time.
iv. Facilitate communication and engagement: The ToC is a valuable communication tool, helping to explain the programme's goals, activities, and expected outcomes to national and international stakeholders including members in the programme organisation. It also helps to engage stakeholders in the design, implementation, and evaluation of the programme.

Goal:

IF Burundi implements a unique combination of flood and drought resilient interventions, centered around a mobile flood barrier, THEN the people and institutions will have strengthened resilience to climate change BECAUSE they will have improved capabilities and access to information services, as well as effective technologies and practices to prevent damages caused by floods and droughts.

Objectives:

- Implementation of information framework and services, to garner insight in weather-related data to improve analyses and decision making with regards to flood and drought events.
- Implementation of innovative adaptation tools, technologies, and practices to prevent flooding and enhance resilience to drought by harnessing water for irrigation purposes.
- Strengthening and improving the capacity of key stakeholders in flood and drought risk management at regional, national, and local levels to undertake innovative adaptation actions that reinforce their resilience to flood and drought events.
- Support existing channels and networks or develop new ones for flood and drought information generation and dissemination at national and sub-national level.

Impact Sustainability Goals (SDGs):

- Decrease in hunger and improved access to nutrition & sustainable agriculture.
- Improved health and wellbeing for people and especially vulnerable groups including women.
- Reduced gap in social-economic wellbeing of men and women.
- Enhanced availability and sustainable management of water.
- Improved economic growth and full employment and decent work for all.
- Capable to take urgent action to combat climate change and its impacts.

Outcomes:

- Increased usage of effective information technology by stakeholders.
- Increased uptake and usage of innovative flood adaptation tools, technologies and practices.
- Increased uptake and usage of innovative drought adaptation tools, technologies and practices.
- Strengthened awareness and ownership of flood and drought adaptation and climate risk reduction processes at local level.

Outputs:

- Efficient and effective flood and drought information technology and services implemented.
- Flood and drought management plans established at national and sub-national level.
- Flood adaptation tools, technologies and practices designed.
- Innovative water-filled mobile flood prevention structures constructed.
- Drought adaptation tools, technologies and practices designed.
- Drought resistant agriculture practiced.
- Good practices and lessons on flood and drought management documented and disseminated.
- Livelihoods of vulnerable groups, including women and youth, are improved.

Hypotheses:

The identified hypotheses are statements about the expected cause-and-effect relationships between specific interventions (e.g. mobile flood barriers) and outcomes. The hypotheses include:

- If effective flood and drought adaptation tools, technologies, and practices are made available to institutions and communities in Burundi, they will be better able to prepare for and respond to the impacts of floods and droughts, leading to reduces damages to land, assets, people and the environment; this goes especially for vulnerable groups including women and youth.
- If institutional linkages and feedback mechanisms related to flood and drought risk management are established, stakeholders will be better able to coordinate their efforts in responding to floods and droughts, leading to more efficient and effective flood and drought risk management and therewith prevent human loss, injuries, enforced migration and damages to assets and the environment.
- If flood and drought information technology and data are made available to stakeholders , including vulnerable groups such as women, they will be better equipped to make informed decisions about flood and drought risk management, leading to more effective flood and drought risk management.
- If comprehensive flood and drought management plans are developed and implemented, stakeholders will be better prepared to respond to floods and droughts, leading to increased resilience through enhanced collaboration and improvement involvement of vulnerable groups including women and youth.
- If capacity building activities related to flood and drought risk management are provided to stakeholders, they will be better equipped to implement flood and drought adaptation measures, leading to increased resilience through enhanced collaboration and improvement involvement of vulnerable groups including women and youth.
- If (sub)-national arrangements for flood and drought management are established, stakeholders will be better able to coordinate their efforts in responding to floods and droughts, leading to more efficient and effective flood and drought risk management through enhanced collaboration and improvement involvement of vulnerable groups including women and youth.

- If lessons on flood and drought management are documented and shared among stakeholders, they will be better able to learn from past experiences and improve their flood and drought risk management practices, leading to more effective flood and drought risk management through increased awareness how to adapt to climate-induced flooding and drought.

Assumptions:

The assumptions are the beliefs and judgments that underpin the logic of the theory. They are the underlying ideas about how change happens, what conditions are necessary for it, and what factors may influence it. The identified assumptions are:

- If institutions and communities, including vulnerable groups such as women, in Burundi have access to effective flood and drought adaptation tools, technologies, and practices, they will be more resilient to the impacts of floods and droughts.
- If institutional linkages and feedback mechanisms are established, flood and drought risk management in Burundi will be more efficient and effective.
- If flood and drought information technology and data are made available / enriched, stakeholders, including vulnerable groups such as women, in Burundi will be better equipped to make informed decisions about flood and drought risk management.
- If flood and drought risks are analyzed, suitable environments for implementing flood and drought measures can be identified.
- If comprehensive flood and drought management plans are developed and implemented, stakeholders, including vulnerable groups such as women, will be better prepared to respond to floods and droughts.
- If capacity building activities related to flood and drought risk management are provided, stakeholders, including vulnerable groups such as women, will be better equipped to implement flood and drought adaptation measures.
- If (sub)-national arrangements for flood and drought management are established, stakeholders will be better able to coordinate their efforts in responding to floods and droughts.
- If lessons on flood and drought management are documented and shared, stakeholders, including vulnerable groups such as women, will be better able to learn from past experiences and improve their flood and drought risk management practices.

Barriers:

The barriers are the obstacles or challenges that may prevent or hinder the desired change from occurring as part of the programme. They are the factors or conditions that must be overcome or addressed to achieve the desired outcome of the programme. The identified barriers are:

- Lack of resources: Implementing the portfolio of interventions (e.g. mobile flood barrier and green measures) requires financial resources. There may be a lack of resources available to fully implement the program, which could limit its effectiveness.
- Limited access to information: In order for the programme to be effective, the beneficiaries in Burundi need to be aware of the interventions available to them and how they can access them; this includes vulnerables groups such as women. However, there may be limited access to information, particularly in rural areas where many people may not have access to the internet or other sources of information.
- Resistance to change: Changing long-standing behaviors and practices can be difficult, particularly if people are not convinced that the proposed interventions will be effective or if they are resistant to change or in case the male-dominated social structures are reluctant to give up (decision) power to women.

- Political instability: Burundi has experienced political instability and conflict in recent years. This instability can make it difficult to implement and sustain the programme over the long term, particularly if political changes result in changes in priorities or funding for the programme.
- Limited technical capacity: Implementing interventions such as information services requires technical expertise. However, there may be limited technical capacity available in Burundi, particularly in rural areas, which could limit the effectiveness of the programme.
- Climate change: Climate change may increase the frequency and severity of floods and droughts in Burundi, making it more difficult to enhance resilience. This could be a barrier to the success of the programme if it is not designed to adapt to changing climate conditions.

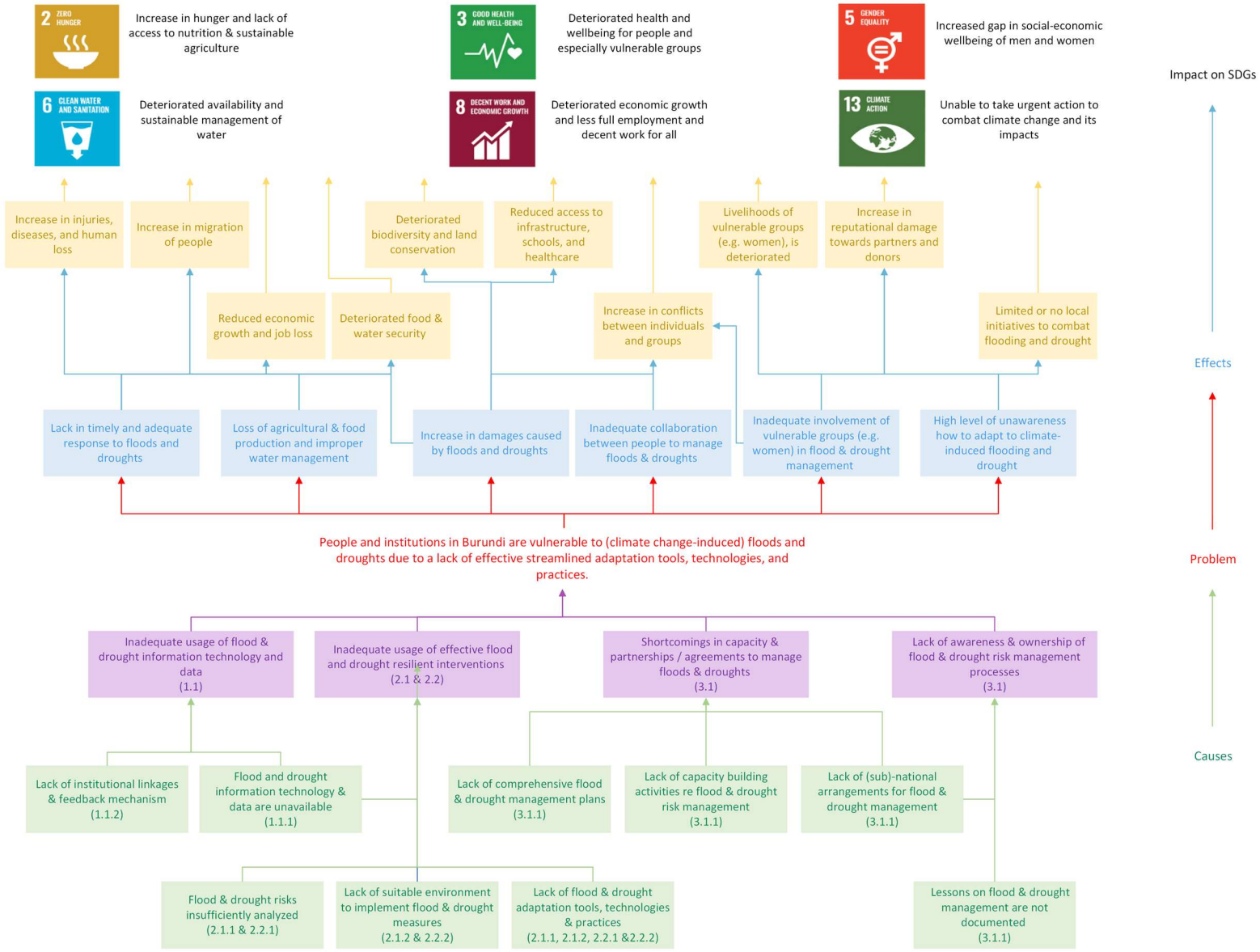
Drivers:

Drivers are factors that are necessary to enable the achievement of the intended outcomes of the programme. The identified enablers include:

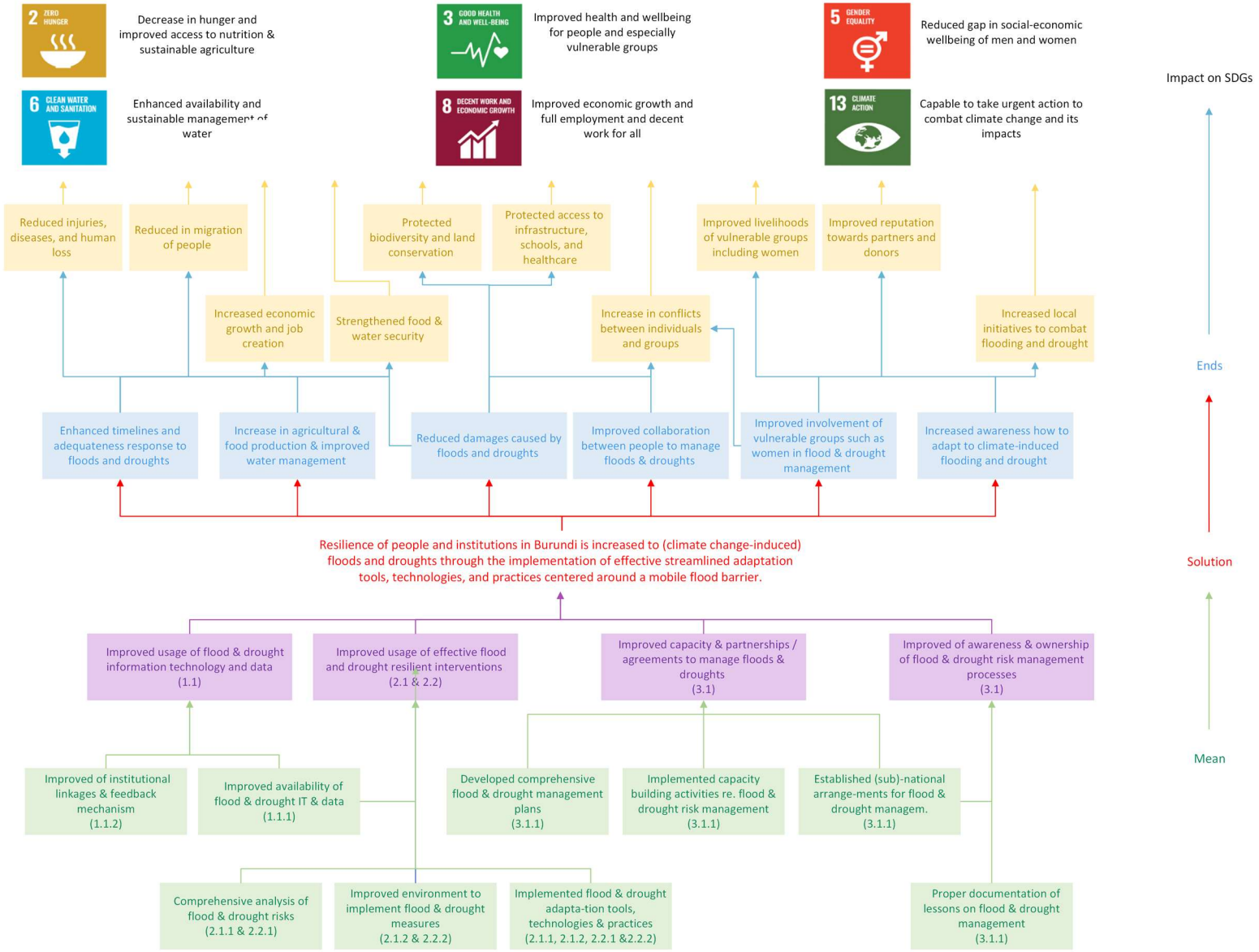
- Political will and commitment to address the problem of flooding and droughts in Burundi at the national and local levels.
- Collaboration and coordination among different stakeholders, including government agencies, civil society organizations, and communities, to address the problem of flooding and droughts in Burundi.
- Availability of resources, both financial and human, to support the implementation of the programme.
- A conducive policy and legal environment that supports flood and drought resilience and encourages innovation and learning.

The ToC is reflected in the "*Problem Tree*" and the "*Solution Tree*" on the next pages.

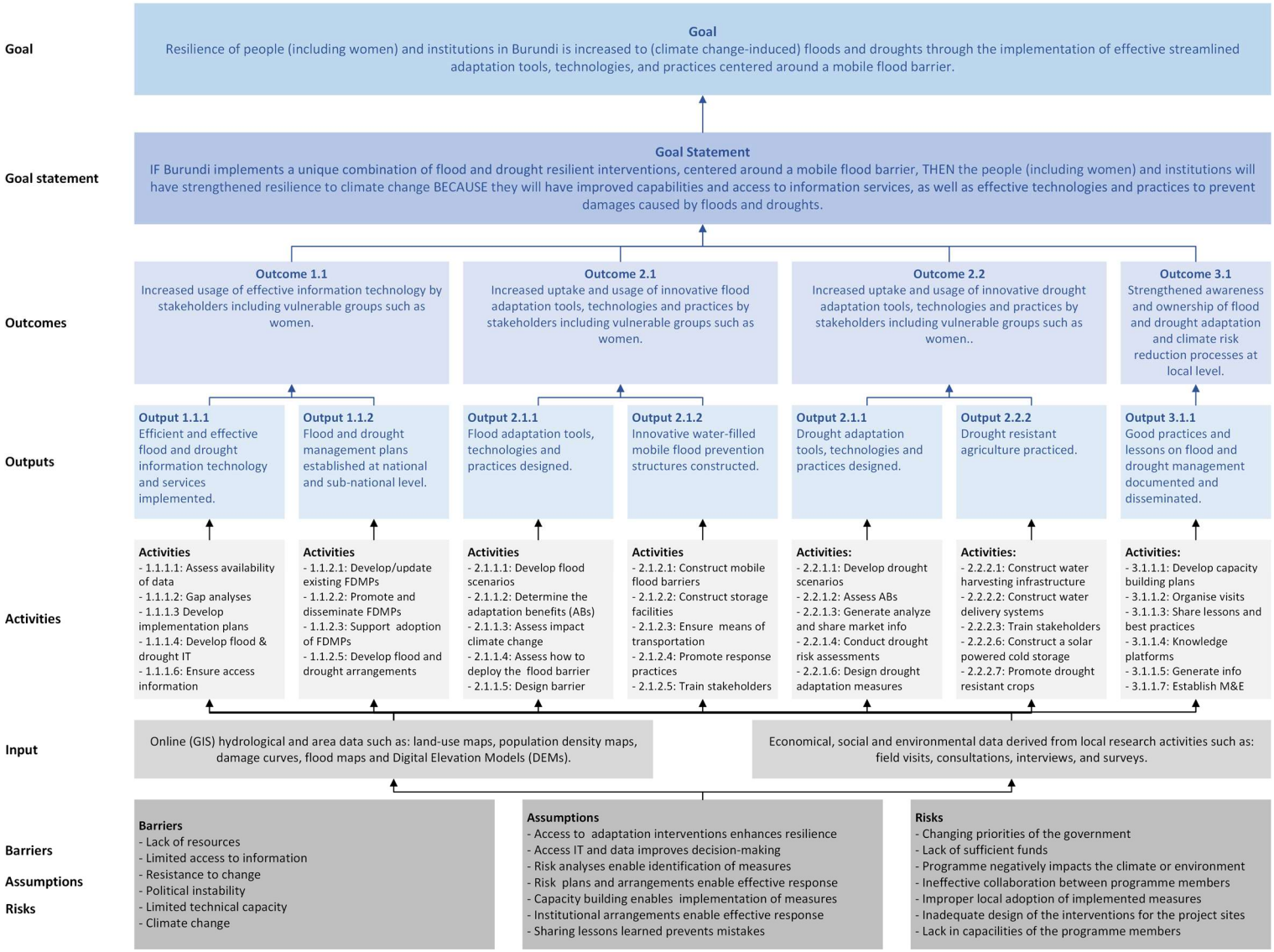
Theory of Change: Problem Tree



Theory of Change: Objective Tree



Theory of Change



Annex 2: Additional tables to be used in the Full Proposal

Table A.: Key lessons learned from pilot project

Perspective	*Lesson learned*	*Intervention strategy*
From the perspective of the SLAMDAM-technology	• LL1: The country lacks in a data rich environment with reliable weather-related to support flood and drought risk analyses.	• The proposed programme shall therefore enrich available hydrometeorological data (including analysis of both in-situ and remote-sensed data opportunities) through usage of LiDAR-technology to create high-resolution Digital Elevation Maps (DEMs) and Land Use maps.
	• LL2: It was unclear to the flood response team when the flood barrier was full, and they had to stop pumping water in; this caused one unit to burst.	• The programme shall implement improved mobile flood barriers that use a special valve or that clearly indicate when the barrier has reached its limit when filling it up with water.
	• LL3: There was only one small capacity pump available to fill the flood barriers with water during the pilot project, which took too much time.	• The proposed programme shall implement multiple high-capacity pumps to ensure rapid deployment of the flood barrier.
	• LL4: The community didn't have a storage facility to store the mobile flood barrier, nor did it have the right equipment to transport it from the facility to the location of deployment.	• The programme shall ensure there is sufficient storage capacity to store the flood barriers as well as transportation means such as trolleys to move the barrier to the location of deployment.
From the perspective of stakeholder engagement	• LL5: A critical success factor of the pilot project was the involvement of a highly qualified local partner with an extensive network who liaised with local stakeholder groups.	• The programme shall involve the same local partner in the organisation who was pivotal in the success of the pilot project.
	• LL6: Communication didn't run smoothly during the pilot project seeing as there was no central coordination of communication activities.	• The programme shall have clear communication lines between different stakeholder groups at national and subnational level. The programme shall also tailor communication to different stakeholders.

Perspective	*Lesson learned*	*Intervention strategy*
	• LL7: It proved to be important to involve all relevant stakeholders early in the project, especially those who will be affected by or have an interest in the project outcomes; this helped build trust and increase ownership of the project.	• The programme shall involve relevant stakeholders as soon as they have been identified.
	• LL8: Local community members and farmers were using the mobile flood barrier for other purposes than initially anticipated by the project team; they were able to realise additional benefits based on their own experience and knowledge.	• The programme shall use a participatory approach to engage with stakeholders and seek their input throughout the project; this can help ensure that the programme meets their needs and expectations.
From the perspective of sustainability	• LL9: Ownership wasn't clearly established during the pilot project, which led to some confusion.	• The programme shall establish community ownership. Community ownership of the programme will help ensure its sustainability. This includes involving community members in decision-making and management and building a sense of ownership and pride in the programme's success.
	• LL10: One unit was damaged, and the local flood response team couldn't repair it during the project due to a lack in training.	• The programme shall build capacity of people and institutions. Building capacity among local communities and organizations will help ensure the programme's long-term sustainability. This includes training on maintenance, repair, and operation of the mobile barriers, as well as on water management practices.
	• LL11: There was no adequate Monitoring and Evaluation (M&E) framework established during the pilot project. No clear roles and responsibilities were embedded to ensure continuous M&E activities.	• The programme shall establish an M&E framework. Regular monitoring and evaluation will help ensure that the programme is achieving its intended goals and identify areas for improvement. This includes tracking key

Perspective	Lesson learned	Intervention strategy
		indicators such as the number of people benefiting from the programme, the amount of water stored, and the frequency and severity of floods and droughts.
	• LL12: A concern was raised by local farmers during the pilot project that there is insufficient funding for them to invest in or sustain climate adaptation measures without support from other investors / donors.	• The programme shall address financing needs. Sustainable financing mechanisms can be critical to the long-term sustainability of the programme. This includes exploring revenue-generating opportunities, seeking funding from multiple sources, and building partnerships with local and international organizations.
From the perspective of scalability potential	• LL13: Import duties and taxes are excessive (150%), which could seriously impact the project budget.	• The proposed programme shall apply for a tax exemption at an early stage.
	• LL14: The need for a blueprint of scalable streamlined interventions was expressed by different stakeholders during the pilot project.	• The programme aims to develop a scalable model centred around the portfolio of streamlined interventions. Developing a scalable model for the programme will help ensure that it can be replicated in other communities or regions. This involves identifying key components of the programme that are essential for its success, as well as developing guidelines or a blueprint for implementation.
	• LL15: The initial discussions on possible replication sites have already taken place during the pilot project. Various stakeholders have suggested possible project sites to implement to proposed interventions; this is indicative of the potential in the country.	• The programme shall identify potential replication sites in Burundi. Identifying potential replication sites can help to expand the impact of the programme. This involves working with local organizations and government agencies to identify areas that are vulnerable to floods and droughts and have a need for water management solutions.

Perspective	*Lesson learned*	*Intervention strategy*
	• LL16: Building partnerships with local and international organizations was shown to help expand the pilot project's reach and impact.	• The programme shall build partnerships. This involves sharing knowledge and resources, as well as building networks to support the replication of the programme in other areas.
From the perspective of the practices/behaviours of beneficiaries on the ground	• LL17: Agricultural production has doubled after the pilot project as farmers use the flood barrier as a reservoir to irrigate their lands during dry season.	• The programme shall guide farmers on how to change their practices to adapt to additional cultivation cycles due to improved water availability.
	• LL18: The pilot project was highly beneficial in understanding how to overcome obstacles related to cultural norms, socio-economic status, and environmental conditions. Due to the risk of theft and vandalism of the mobile flood barrier, we decided to hire security for the time the barrier was deployed.	• The programme shall take into account cultural norms, socio-economic status, and environmental conditions, which influence practices and behaviours. Mitigating measures will be implemented in the programme to reduce the risk of theft and vandalism.
	• LL19: Beneficiaries adopted new practices and behaviours because they were involved in the design and implementation of interventions. The mobile flood barrier was widely accepted during the pilot project.	• The programme shall involve beneficiaries during the design and implementation phase. The programme will follow a co-design process and implement a feedback mechanism to ensure acceptance by local stakeholders.
	• LL20: The pilot project confirmed that involvement of someone who speaks the native language is a prerequisite for success.	• The programme shall apply effective communication and awareness-raising which will help to ensure that beneficiaries understand the purpose and benefits of the programme, as well as how to participate effectively. This will involve using local languages, visual aids, and community meetings to share information about the programme.

Table B.: Benefits of the project

Project outcome	Economic benefits	Social benefits	Environmental benefits
Outcome 1.1: *Increased usage of effective information technology by stakeholders.*	• Enhanced understanding on how to extract the most economic value of adaptation practices, tools and technologies. • Decrease in financial damages due to timely and effective disaster response enabled by information services. • Increase in crops and livestock production through smart agriculture and software/apps.	• Information services (e.g. early warning) will prevent human loss, injuries and diseases. • Protecting social assets through the implementation of information services. • Enhanced livelihoods by effective disaster management through information services. • The information will provide input to the population to adapt agricultural practices.	• A better understanding of how the environment is impacted by floods and drought and how to protect the environment. • More efficient and effective utilization of natural resources through information services.
Outcome 2.1: *Increased uptake and usage of concrete and innovative flood adaptation actions.*	• Prevention of direct and indirect financial damages caused by flooding. • Increase in crops and livestock production by preventing inundation of (agricultural) land. • Creation of new jobs to support flood disaster management.	• Reduced loss of human lives, injuries and diseases. • Improved quality of life through increase in jobs and income. • Reducing social unrest, conflicts and, migration of community members because their livelihoods were destroyed by floods. • Protection of damages to social assets such as schools and healthcare facilities.	• Protection of biodiversity and (agricultural) land from flood damages. • Prevention of land erosion caused by flood events.

Project outcome	Economic benefits	Social benefits	Environmental benefits
Outcome 2.2: *Increased uptake and usage of concrete and innovative drought adaptation actions.*	• Increase in crops and livestock production through enhanced water availability and water harvesting and irrigation structure. • Creation of new businesses due to increase in arable land. • Creation of new jobs to support drought disaster management.	• Enhancing of food and water security for the drought-affected populations. • Improved quality of life through increase in jobs and income. • Increase availability of drinkable water. • Reducing social unrest, conflicts and, migration of community members seeking water and other sources of livelihoods	• Enhanced water availability for human and livestock populations and arable land. • Increase in efficient usage of water. • Improved protection and restoration of ecosystems through the uptake in availability of water. • Improved land management/conservation infrastructure, leading to reduced soil loss and increased quantity of agricultural produce.
Outcome 3.1: *Strengthened awareness and ownership of flood and drought adaptation and climate risk reduction processes at local level.*	• Increase in availability of national expertise decreases the costs for external knowhow.	• Adaptive capacity of communities to flood and drought increased. • General raising of awareness of impact of climate change to the community and the need for an enhanced role by the community • Strengthening the active participation of vulnerable populations in decisions linked to climate change.	• Improved understanding amongst various organisations and communities on how to protect the environment.

Table C.: Overview predefined benefit indicators

Benefit Area	Indicators	Unit
Physical and natural assets made more resilient to climate induced flooding	Total area directly benefiting from more resilient physical and natural assets	(Km^2 / USD)
	Agricultural landscape protected from flood damage	(Km^2 / USD)
	Urban landscape protected from flood damage	(Km^2 / USD)
	Rural landscape protected from flood damage	(Km^2 / USD)
	Residential houses protected from flood damage	(Number / USD)
	Public buildings protected from flood damage	(Number / USD)
	Industrial or commercial units protected from flood damage	(Number / USD)
	Small businesses / shops protected from flood damage	(Number / USD)
	Irrigation or water structures protected from flood damage	(Number / USD)
	Ports or landing sites protected from flood damage	(Number / USD)
		Indirect (USD)
	Airports protected from flood damage	Damage (USD) prevented
		Indirect (USD)
	Roads protected from flood damage	(Km / USD)
		Number individuals
	km rail networks protected from flood damage	Repair costs (USD) avoided
		Affected individuals prevented
Livelihoods and sources of income of vulnerable populations diversified and strengthened	Total no. of direct beneficiaries with diversified and strengthened livelihoods and sources of income	Number
	Male	Number
	Female	Number
	Reduction in No. people displaced / migrated	Number (specified per group)
	Reduction in No. injuries and deaths	Number (specified per group)
	Reduction in No. jobs lost	Number (specified per group)
	Other	(specified per group)
The number of people who are warned in advance of climatic induced floods and drought grows and the warning consistency and reliability is increased	Total no. of direct beneficiaries from the new/improved climate information systems	Number (specified per group)
	No. of Climate hazards addressed compared to before	Number
	No. of people who are warned for climate risks in advance	Number (specified per group)
	Increase in percentage of uptime of weather information system	Percentage uptime
	No. of correct warnings issued	Percentage
	No. of people who have become more aware of their climate risks	Number

Benefit Area	Indicators	Unit
	Hours between warning issue and climate disaster (lead-time)	Hours
	No. of platforms to disseminate climate warnings has increased	Number
Vulnerable natural ecosystems strengthened in response to climate change impacts	Vulnerable ecosystem protected	Protected area (ha)
Active, skilled and materialised local flood and drought response team	Total no. of direct beneficiaries from more resilient physical and natural assets	Number of people (Total / Male / Female)
	Km mobile flood barrier	Km.
	Litre water that can be stored in the mobile barrier	Liter
	People trained on how to operate and maintain the flood barrier	Number of people (specified per group)
	Strategically located storage facilities	Number
Number of people trained and informed regarding climate change impacts and appropriate adaptation responses	People are trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	People at line ministries are trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	Community / association members trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	Extension service officers trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	Hydromet and disaster risk management agency staff trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	Small private business owners trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	Schoolchildren, university students or teachers trained and informed regarding climate change impacts	Number of people (Total / Male / Female)
	Other (specify)	Number of people (Total / Male / Female)

Table D.: Programme alignment with (sub-)national strategies, plans and programmes

Strategy/plan/programme	*Year published*	*Priorities*	*Programme compliance/contribution*
1. Strategic plan: National Action Plan for Adaptation (NAPA)[40]	2007	• Control the river dynamics of watercourses and torrents in Mumirwa, including the city of Bujumbura. • Popularise short cycle and dryness resistant food crops. • Popularise rainwater harvesting techniques for agricultural or domestic use. • Train and inform the decision makers and other partners, including the local communities on the methods of adaptation to climate variability. • Improve seasonal early warning climate forecasts.	• Prevent flooding and control water availability in Bujumbura Mairie and Rural Provinces. • Enhance smart agriculture practices, tools and technologies. • Implement water harvesting structures to harness flood water. • Capacity building of different stakeholder groups to improve skillset to enhance resilience to floods and drought using innovative adaptation practices, tools and technologies. • Implement information services including early warning systems.
2. Strategic plan: National Climate Change Strategy and Action Plan[41]	2012	• Integrate disaster risk reduction into policies and plans for sustainable development. • Develop and strengthen institutions, mechanisms and capacities to build resilience to hazards. • Systematically consider risk reduction in emergency preparedness/response/recovery activities.	• Innovative adaptation practices, tools and technologies (e.g. mobile flood barriers) will be integrated into plans and policies. • Capacity building of institutions and communities to build resilience to floods and drought supported by mechanisms (processes, toolkits etc.).

[40] Burundi Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

[41] Nile Basin Initiative (2013): Climate Change Strategy. www.nilebasin.org/index.php/media-center/publications/doc_down- load/104-nbi-climate-change-strategy.

Strategy/plan/programme	Year published	Priorities	Programme compliance/contribution
			• Risk appetite is defined and adaptive measures and practices to reduce disaster risks are included in plans.
3. Strategic plan: Nationally Determined Contributions (NDC)[42] / National Strategy and Action Plan on Climate Change (2012)	2021	***Climate risk adaptation and management.*** • Integrated water resources management by a small hydrological unit. • Integrated management of climate risk and forecasts over time (by means of probabilities and forward-looking studies) so as to be able to take action in advance. • Protection of aquatic and land-based ecosystems. • Coaching of the population to develop their resilience to climate change. • Establishment of functional monitoring and evaluation mechanisms for climate change, as well as knowledge management and information mechanisms. • Promotion of climate-smart agriculture (agrometeorology).	***Climate risk adaptation and management.*** • A water harvesting structure will be implemented to harness water upstream to enhance water security. • Information services will be implemented to analyse/forecast flood and drought risks that triggers response strategies/actions. • Flood events will be prevented using a mobile flood barrier to protect ecosystems. • Capacity building of institutions and the populations will be held to develop resilience to climate change in the water sector. • A monitoring and evaluation and knowledge sharing system and tools will be implemented. • Climate-smart practices, tools and technologies will be implemented to enhance crops production.
		Capacity-building, knowledge management and communication. • Enhancement of data and information management and distribution mechanisms.	***Capacity-building, knowledge management and communication.*** • Weather data will be collected and information management will be standardised and centralised.

[42] Republic of Burundi (2018). Nationally Determined Contribution. Available via http://www4.unfccc.int/ndcregistry/PublishedDocuments/Burundi%20First/CPDN%20BURUNDI.pdf

Strategy/plan/programme	Year published	Priorities	Programme compliance/contribution
		• Strengthening of the information and data communication and exchange system. • Reinforcement of climate change impact tracking systems by means of observations and investigations.	• Data and information communication will be standardised and centralised supported by toolkits and information services. • Monitoring and evaluation activities will be embedded to keep track of the damages caused by floods and drought.
4. Strategic plan: Burundi national development plan NDP Burundi 2018-2027.[43]	2018	• Strengthening the economy of Burundi by enhancing national productivity. • Strengthening the economy of Burundi by creation of new jobs.	• Arable land will be protected from floods to increase the potential to grow crops. • Water will be harnessed during flood season and for irrigation purposes and as drinking water increasing crops and livestock products. • Smart agriculture practices will be implemented to realise the highest yield. • Linkages will be made with buyers to increase sales and create new jobs.
5. Strategic plan: Third national communication on climate change (TNCCC). [44]	2019	• Capacity building in weather, climate and hydrological modelling and to cover all aspects of agro-meteorological assistance. • Promote, encourage and support community adaptation strategies related to agriculture and livestock to cope with climate change.	• Implementation of information services including hydrological modelling software and capacity building of local staff. • Implementation of knowledge management framework to ensure stakeholder groups have access to and can disseminate information on adaptation practices, tools and technologies.

[43] https://www.presidence.gov.bi/wp-content/uploads/2018/08/PND-Burundi-2018-2027-Version-Finale.pdf

[44] https://unfccc.int/sites/default/files/resource/Burundi%20TNC%20executive%20summary.pdf

Strategy/plan/programme	Year published	Priorities	Programme compliance/contribution
		• Integrate climate and environmental issues into water and resources sanitation improvement strategies/plans and develop risk assessments and measures for emergency situations.	• Implementation of smart agriculture practices and development of flood and drought adaptation plans to adapt agriculture and livestock production to climate change. • Develop flood and drought risk assessments and implement adaptation practices, tools and technologies and amend strategies and plans.
6. Strategic plan: National Strategy and Action Plan to Combat Soil Degradation 2011-2016.[45]	2011	• Improved fertility of agricultural soils and ecological conditions in degraded areas. • Institutional and community capacity building in soil management.	• Information services will be implemented to support soil management. • Agricultural land will be protected from floods to increase the potential to grow crops. • Water will be harnessed during flood season and to improve fertility of land. • Smart agriculture practices and capacity building will be conducted to enhance soil management. • Implementation of knowledge management framework to ensure stakeholder groups have access to and can disseminate information on soil management.
7. Strategic plan: National Water Strategy 2011 – 2020.[46]	2012	• Prevention and management of water-related disasters and protection of Water Resources.	• Implementation of innovative adaptation practices, tools and technologies to enhance resilience to floods and drought including information services and flood barriers.

[45] http://obpe.bi/images/pdf/Strategie_Degration_des_terres.pdf

[46] https://www.pseau.org/outils/ouvrages/meeatu_strategie_nationale_de_l_eau_2011_2020_1970.pdf

Strategy/plan/programme	*Year published*	*Priorities*	*Programme compliance/contribution*
		• Instruments for the Integrated Management of Water Resources. • Cooperation for the management of shared water resources with involvement of women and special consideration for vulnerable groups.	• Development of flood and drought management plans and creating MOUs/partnership agreements. • Ensuring involvement of women in flood and drought risk management activities. Specific sections in the flood and drought management plans on how to protect vulnerable groups. • Implementation of knowledge management framework to ensure stakeholder groups have access to and can disseminate information on water management.
8. Strategic plan: National Agriculture Strategy 2018-2027.[47]	2018	• Rational and optimal exploitation of natural resources, in particular land and water resources. • Development of resilience to climate change. • Processing and preservation of food, pastoral and fishery products. • Capacity building of institutional and organizational structures.	• Implementation of innovative adaptation practices, tools and technologies (e.g. information services and flood barriers) to improve access to natural resources. These solutions also enhance resilience to climate change-induced floods and drought. • Implementation of smart agricultural practices and a solar powered cold storage unit to improve production and preservation of food. • Capacity building of institutions and the populations will be held to develop resilience to climate change in the water sector.
9. Strategic plan: Technology Needs	2016	***Water Resources sector*** • Monitoring water quantities.	• Implementation of hard- and software to monitor weather/hydrodynamic data.

[47] http://extwprlegs1.fao.org/docs/pdf/Bur190783.pdf

Strategy/plan/programme	Year published	Priorities	Programme compliance/contribution
Assessment – Adaptation.[48]		• Harnessing rainwater • Control of the rain dynamics. ***Agriculture and Livestock sector*** • Soil conservation systems. • Development of the short cycle rice variety • Community early warning systems	• The implementation of water harnessing infrastructure using innovative technologies. • The implementation of tools, technologies to control rain dynamics such as mobile flood barriers. • Agroecosystem management practices will be to increase agricultural productivity and food security through better to conservation of soil and water resources and crops management. • The programme shall implement flood and drought early warning systems.
10. Strategic plan: Technology Action Plan – Adaptation.[49]	2018	• As per above	• As per above
11. Programme: Climate proofing food production investments in Imbo and Moso basins in the Republic of Burundi.[50]	2020	• Transforming current agro-ecological land and water management practices in the upper, middle, and lower Imbo and Moso catchments towards more sustainable and productive land use practices. • Build farmers' resilience to climate change in the upper, middle, and lower Imbo and Moso catchments and to increase agricultural productivity and food security through adoption of better agroecosystem	• Floods will be prevented and water will be stored in a water harvesting structures to enhance water security near the Imbo catchment. • Agroecosystem management practices will be implemented at the Imbo catchment to increase agricultural productivity and food security through better to conservation of soil and water resources.

[48] https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/e2a748d4d7fb46a886411a2739cf72d7/eb976df133a34e74b758e3e22fd15490.pdf
[49] https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/faba3d9fb058453bb241a7c2b4d0c640/3239bd8f111e4c5b806077e759c98ad0.pdf
[50] https://www.greenclimate.fund/sites/default/files/document/sap017-ifad-burundi.pdf

Strategy/plan/programme	Year published	Priorities	Programme compliance/contribution
		management practices to conserve soil and water resources.	
12. Programme: Community Disaster Risk Management in Burundi (*Bugesera, Mumirwa and Imbo LowlandsÕ regions*)[51]	2012	• Early warning systems (on climate change induced risks including new or emerging vulnerabilities and hazards) established for communities. • Livelihoods and infrastructure risk assessment undertaken with gender-focused analysis. • Policy actions undertaken on the basis of anticipated climate change projections. • Flood Control in Bujumbura.	• Implementation of information services including flood and drought early warning systems. • Adaptation benefits mechanism is developed and applied to perform flood and drought risk analysis and interventions are designed to support vulnerable groups including women and children. • The impact of climate change on flood and drought risks are analysed and corresponding adaptation actions are designed and incorporated in policies and plans. • Flood control structures will be implemented in Bujumbura to enhance resilience to floods.

[51] https://www.thegef.org/projects-operations/projects/4990

Table E.: Overview Adaptation Fund (AF) principles and corresponding national standards and compliance by project

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
1. *Compliance with the Law*	Law No. 1/10 of June 30, 2000 on the Environmental Code of the Republic of Burundi.[52]	When developments, works or facilities risk harming the environment, the code obliges the petitioner or contracting authority to draw up and submit to the administration of the environment an impact study making it possible to assess the direct or indirect impacts of the project on the ecological balance, the environment and the quality of life of the population and the impacts on protection.	• **Activities 2.1.2.1., 2.1.3.1., 2.1.3.2., 2.2.1.1, 2.2.3.2, 2.2.3.3., 2.2.3.5:** Construction of adaptation technologies (e.g. mobile flood barriers, storage facilities, irrigation system) are subject to Environmental Impact Assessments (EIAs) to ensure that all potential risks are managed according to the national law and safeguards standards. • The project shall carry out an ESIA The Office Burundais pour la Protection de l'Environnement (OBPE) will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
	Decree No. 100/22 of October 07, 2010 on measures for the application of the environmental code in relation to the environmental impact study procedure.[53]	This decree, in its articles 4 and 5, classifies projects into three categories: (i) projects that must be submitted to an environmental impact study regardless of the cost of their implementation, (ii) projects that are subject to an environmental impact study when the Ministry of the Environment considers that the characteristics, location or even the scale of the planned work are likely to affect the environment and (iii) projects which should not be subject to EIA	• **Project initiation:** During the project initiation phase, the project shall carry out an ESIA. The OBPE will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).

[52] https://www.obpe.bi/images/pdf/cadreGestion.pdf

[53] https://www.obpe.bi/images/pdf/cadreGestion.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
2. *Access and Equity*	Law No. 1/02 of March 26, 2012 on the Water Code in Burundi and its implementing texts.[54]	Avoid waste of water and in a watershed, the different uses of water are considered together and each use takes into account its effects on the others.	• **Activity 1.1.1.3:** Information services are developed to enable efficient use of water and prevent waste. • **Activities 3.2.1.2:** Multi-sectoral/stakeholder agreements and platforms are developed to coordinate usage of water. • **Activities 4.1.1.2:** Knowledge sharing framework/platforms to disseminate/share knowledge on how water is used and the effects of adaptation practices, tools and technologies. The General Directorate of Water Resources and Sanitation (DGREA) will monitor compliance with this law and national standards through control and regulation of the use of water resources.
	Decree No. 100/189 of August 25, 2014 on the procedures for determining and installing the protection perimeters of water catchments intended for human consumption.[55]	The development of the perimeter is subject to the prior obtaining of competent authorisation, whatever the type of protection perimeter (article 3). Authorizations are issued by (i) the Minister in charge of water if the catchment is equipped with a water supply system and (ii) by the municipal administrator if the catchment does not include an adduction system, (articles 4 and 12). Any establishment of an immediate protection perimeter is preceded by the allocation of fair and prior	• **Activity 2.2.3.1:** A water harvesting and storage infrastructure will be constructed that shall not obstruct a minimum flow or volume of water guaranteeing the life, movement and reproduction of the species that inhabit the water. • **Activities 2.1.2.1 and 2.1.3.1:** Ground works will be performed, and flood barriers will be deployed taking into consideration water supply for human consumption. The General Directorate of Water Resources and Sanitation (DGREA) will monitor compliance with this law and national standards through control and regulation of the use of water resources.

[54] https://www.obpe.bi/images/pdf/cadreGestion.pdf

[55] https://www.obpe.bi/images/pdf/cadreGestion.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
		compensation to owners and holders of other land rights on the non-state part of the perimeter in question, in accordance with the provisions of the land code in expropriation in the public interest (Article 10).	
	Decree-law No. 1/006 of April 4, 1991, the 'International Convention on the Elimination of All Forms of Discrimination against Women. Law adopting the Code of Persons and Family, in its Article 126, briefly touches on gender dimensions in the management of real estate, including land ownership.	Condemn discrimination against women in all its forms and commit to 'taking all appropriate measures, including legislative measures, to modify or abolish any laws, regulations, customs, or practices that constitute discrimination against women. This provision stipulates that no spouse can, without the consent of the other alienate or encumber with real rights the properties or enterprises belonging to the conjugal community, nor dispose of said rights or assets free of charge, even for the establishment of common children.	• **Activities 2.1.2.1 and 2.1.3.1:** Ground works will be performed, and flood barriers will be deployed taking into consideration women's ownership and access to real estate. The Ministry of National Solidarity will monitor compliance with this law and national standards through verification during project implementation that benefits for vulnerable groups are assured .
3. *Marginalized and Vulnerable Groups*	Article 22 of the Constitution of 18 March 2005.[56]	All citizens shall be equal before the law, which shall guarantee them equal protection. No-one may be discriminated against on the grounds of origin, race, ethnicity, gender, colour, language, social situation, religious, philosophical or	• **Activity 3.1.1.1:** Flood and drought management plans / strategies reflect the roles and responsibilities of the people involved. The project ensures that the plans don't allow for any form of discrimination. • **Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5:** Capacity building and training of various stakeholder groups

[56] https://tbinternet.ohchr.org/_layouts/15/treatybodyexternal/Download.aspx?symbolno=E/C.12/BDI/1&Lang=en

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
		political convictions or for being a carrier of HIV/AIDS or any other incurable illness.	includes representatives of various groups without any form of discrimination. • **Activity 3.2.1.2:** Flood and drought management multi-sectoral/stakeholder agreements include sections about prevention of discrimination. The Ministry of National Solidarity will monitor compliance with this law and national standards through verification during project implementation that benefits for vulnerable groups are assured .
4. Human Rights	Article 52 of the Constitution of 18 March 2005.[57]	Everyone is entitled to the enjoyment of the economic, social and cultural rights indispensable to their dignity and freedom of personal development, as a result of the national effort in this regard bearing in mind the country's resources".	• **Activity 3.1.1.1:** Flood and drought management plans reflect the roles and responsibilities of the people involved. The project ensures that there is no discrimination in the plans. • **Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5:** Capacity building and training of various stakeholder groups includes representatives of various groups without any form of discrimination. • **Activity 3.2.1.2:** Flood and drought management multi-sectoral/stakeholder agreements include sections about prevention of discrimination. The Ministry of National Solidarity will monitor compliance with this law and national standards through verification during project implementation that benefits for vulnerable groups are assured.

[57] https://tbinternet.ohchr.org/_layouts/15/treatybodyexternal/Download.aspx?symbolno=E/C.12/BDI/1&Lang=en

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
5. *Gender Equality and Women's Empowerment*	National Gender Policy (NGP), 2012–2025, Ministère de la Solidarité Nationale, des Droits de la Personne Humaine et du Genre (2011)	The 2012–2025 NGP and accompanying action plan sets out to: • Facilitate the creation of a sociocultural, legal, economic, political, and institutional environment conducive to the achievement of gender equality. • Promote the mainstreaming of gender into development interventions in all areas. • Strengthen equitable access of women, men, and adolescents to social services.	• **Activity 3.1.1.1:** Flood and drought management plans reflect the roles and responsibilities of the people involved. The programme ensures that the interest of women will be considered when implementing flood and drought adaptation. • **Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5:** Capacity building and training of various stakeholder groups includes a substantial number of women who shall participate. • **Activity 3.2.1.2:** Flood and drought management multi-sectoral/stakeholder agreements will include gender considerations . The aim is to have women in higher functions with regards to flood and drought adaptation. The Ministry of National Solidarity will monitor compliance with this law and national standards through verification during programme implementation that gender equality is strengthened. Gender mainstreaming is in accordance with code 2a from the UNEP gender marker table i.e. Gender well mainstreamed Gender is reflected in the context, implementation, log frame. The gender marker table is available at the end of annex E.
6. *Core Labour Rights*	Decree Law No. 1/037 of 07/07/1993 revising the labor code of the Republic of Burundi.[58]	Section 146 of Part 6 on occupational safety and health provides that "employers shall be required to comply with the provisions in force regarding the	• **Activity 3.1.1.1:** Flood and drought management plans reflect the roles and responsibilities of the people involved. The project ensures that vulnerable groups

[58] https://www.obpe.bi/images/pdf/cadreGestion.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
		hygiene and safety of workers, the organisation and operation of corporate medical and health services,and special working conditions for pregnant women and young people".	such as women will benefit from flood and drought adaptation. • **Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5:** Capacity building and training of various stakeholder groups includes labour rights. • **Activity 3.2.1.2:** Flood and drought management multi-sectoral/stakeholder agreements include sections about labor rights where relevant. The Ministry of National Solidarity will monitor compliance with this law and national standards through verification that social security legislation is applied accordingly.
7. *Indigenous Peoples*	The Constitution of the Government of Burundi.	Burundi has no specific legislation addressing the situation of the Twa, and the main legal reference for their rights is the current Constitution, which was approved by popular referendum in 2005. The Constitution recognizes the ethnic diversity of Burundi and includes in several of its articles the principle of ethnic quotas and co-optations to reflect this diversity and ensure the participation of the three ethnic groups. At the same time it prohibits any form of exclusion based on ethnicity or regionalism.[59]	• **Activity 3.1.1.1:** Flood and drought management plans reflect the roles and responsibilities of the people involved. The project considers the different ethnic groups when implementing flood and drought adaptation. • **Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5:** Capacity building and training of various stakeholder groups considers participation of the various ethnic groups. • **Activity 3.2.1.2:** Flood and drought management multi-sectoral/stakeholder agreements include sections about involvement of the various ethnic groups where relevant. The Ministry of National Solidarity will monitor compliance with this law and national standards

[59] https://www.ifad.org/documents/38714170/40224460/burundi.pdf/969773f0-9429-49d3-bccf-d02d4cbcdac4?t=1651742303327

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
			through verification during programme implementation that equality of vulnerable social groups is assured.
8. *Involuntary Resettlement*	The Land Code of the Republic of Burundi, Law No. 01/008 of 01/09/1986.[60]	The law provides the procedure for resettlement. Responsibility for resettlement lies with the Ministry of Water, Environment, Land and Urban Planning (MEEATU), but if land is in a wetland, the responsibility lies with the Ministry of Agriculture and Livestock.	• **Activities 2.1.1.1 and 2.2.1.1:** Development of flood and drought scenarios takes into consideration settlements. • **Activities 2.1.2.1., 2.1.3.1., 2.1.3.2., 2.2.1.1, 2.2.3.2, 2.2.3.3., 2.2.3.5:** In case construction of adaptation technologies (e.g. mobile flood barriers, storage facilities, irrigation system) require resettlements, the project will follow the right procedure with appropriate authorization. • **Activity 3.1.1.2:** Flood and drought management plans consider resettlement plans and strategies. The OBPE will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
	AFRICAN DEVELOPMENT BANK OP. 4.12 (INVOLUNTARY RESETTLEMENT).[61]	Any development project should avoid or minimize involuntary resettlement and where this is not feasible, it should assist displaced persons in improving or at least resorting their livelihoods and living standards in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of	• **Activities 2.1.1.1 and 2.2.1.1:** Development of flood and drought scenarios takes into consideration settlements with an aim to minimize involuntary resettlement. • **Activities 2.1.2.1., 2.1.3.1., 2.1.3.2., 2.2.1.1, 2.2.3.2, 2.2.3.3., 2.2.3.5:** In case construction of adaptation technologies (e.g. mobile flood barriers, storage

[60] https://esa.afdb.org/sites/default/files/MULTINATIONAL%20BURUNDI-TANZANIE-RUMONGE-BUJUMBURA%20%20ROAD%20SECTION%20RAP%20%20%204th%20July%202018%20%282%29%20%281%29.pdf
[61] https://esa.afdb.org/sites/default/files/MULTINATIONAL%20BURUNDI-TANZANIE-RUMONGE-BUJUMBURA%20%20ROAD%20SECTION%20RAP%20%20%204th%20July%202018%20%282%29%20%281%29.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
		project implementation, whichever is higher.	facilities, irrigation system) require resettlements, the project aims to minimize involuntary resettlement. • **Activity 3.1.1.2:** Flood and drought management plans aim to minimize involuntary resettlement. The OBPE will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
9. *Protection of Natural Habitats*	Law No. 1/10 of May 30, 2011 on the creation and management of protected areas in Burundi.[62]	Protected areas must be considered in the overall development plan and their management must go hand in hand with the development of the human environment along the river, and the participatory management of protected areas must be concerned improvement of the living environment of local communities (article 29).	• **Activities 2.1.1.1 and 2.2.1.1:** Development of flood and drought scenarios takes into consideration protected land and the living environment of local communities. • **Activity 3.1.1.2:** Flood and drought development plans are aligned with national and international climate objectives and national development plans and programs. The OBPE will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
	Law No. 1/02 of March 26, 2012 on the Water Code in Burundi and its implementing texts.[63]	The water code stipulates protected zones: 150 m wide on the shores of Lake Tanganyika, 25 m on each side of the lake's tributary rivers and 5 m for rivers not tributary to the lake. In the implementation of the project, it will be necessary to avoid carrying out investments in	• **Activities 2.1.2.1., 2.1.3.1., 2.1.3.2., 2.2.1.1, 2.2.3.2, 2.2.3.3., 2.2.3.5:** Construction of adaptation technologies (e.g. mobile flood barriers, storage facilities, irrigation system) takes into consideration the protected zones. The General Directorate of Water Resources and Sanitation (DGREA) will monitor compliance with this

[62] https://www.obpe.bi/images/pdf/cadreGestion.pdf

[63] https://www.obpe.bi/images/pdf/cadreGestion.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
		these areas, except for irrigation works.	law and national standards through controlling adherence to the national water resource management policy.
10. *Conservation of Biological Diversity*	Law No. 1/10 of June 30, 2000 on the Environmental Code of the Republic of Burundi (Titles III and IV).[64]	Works, structures and facilities to be carried out in the beds of watercourses will be designed and built in such a way as to maintain a minimum flow or volume of water guaranteeing the life, movement and reproduction of the species that inhabit the water at the time of carrying out these works, structures and developments (section 53).	• **Activity 2.2.3.1:** A water harvesting and storage infrastructure will be constructed that shall not obstruct a minimum flow or volume of water guaranteeing the life, movement and reproduction of the species that inhabit the water. The OBPE will monitor compliance with this law and national standards through verifying compliance with environmental standards in terms of ecological balance, habitat protection, species protection and propose all safeguard and protection measures.
	Law No. 1/28 of 24/12/2009 relating to the health policy of domestic, wild and aquaculture animals and bees.[65]	The law gives responsibility to three Ministries to protect animals. These are the Ministry of Agriculture and Livestock, the Ministry of Water, the Environment, Territorial Development and Urban Planning and the Ministry of Public Security.	• **Activity 2.2.3.1:** Water harvesting structures are in place to improve water security for animals such as livestock. • **Activity 3.1.1.1:** Flood and drought management plans take into consideration the protection of animals. The Ministry of the Environment, Agriculture and Livestock will monitor compliance with this law and national standards through the implementation of policies and laws related to livestock. This ministry will ensure that all animal health measures are implemented. The Department of Animal Health of this ministry will ensure the implementation of regulatory tests on animal health

[64] https://www.obpe.bi/images/pdf/cadreGestion.pdf

[65] https://www.obpe.bi/images/pdf/cadreGestion.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
11. *Climate Change*	The United Nations Framework Convention on Climate Change (UNFCCC).[66]	Take precautionary measures to prevent or mitigate the causes of climate change and limit their harmful effects (Article 3)	• **Activities 2.1.2.1., 2.1.3.1., 2.1.3.2., 2.2.1.1, 2.2.3.2, 2.2.3.3., 2.2.3.5:** Construction of adaptation technologies (e.g. mobile flood barriers, storage facilities, irrigation system) takes into consideration the impact on climate change. The Geographical Institute of Burundi (IGEBU) will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
12. *Pollution Prevention and Resource Efficiency*	Law No. 1/02 of March 26, 2012 on the Water Code in Burundi and its implementing texts.[67]	Appropriate measures must be taken at all levels to ensure efficient management of resources and infrastructures, and to reduce the costs of water services.	• **Activity 3.1.1.1:** Flood and drought management plans describe how to ensure efficient management of water and supporting infrastructures. • **Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5:** Capacity building of various stakeholder groups and innovative adaptation practices enable efficient management of water and supporting infrastructures. The General Directorate of Water Resources and Sanitation (DGREA) will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA) and check-ups during the implementation.
13. *Public Health*	Decree 100/177 of July 9, 2013 on health inspection measures for animals and food	This decree lays down the health inspection and control measures for animals and products of animal origin, including live animals, meat, milk and dairy products (see chapter II, section 2, 3 and 5).	• **Activities 2.2.3.3:** Harvested water will be made suitable for livestock to prevent health issues. • **Activities 3.1.2.5:** Farmer and pastoralist groups are trained on innovative climate smart agricultural/livestock practices keeping in mind health measures.

[66] https://www.obpe.bi/images/pdf/strategic_framework_environment_management.pdf

[67] https://www.obpe.bi/images/pdf/cadreGestion.pdf

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
	products of animal origin.[68]		The Directorate of Animal Health at the Ministry of the Environment, Agriculture and Livestock will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
	Decree-Law No. 1/033 of June 30, 1993 on plant protection in Burundi.[69]	This law establishes the principles and rules governing phytosanitary protection in Burundi. Phytosanitary treatments must be carried out in compliance with good agricultural practices in order to preserve human and animal health and protect the environment.	• **Activities 3.1.2.5:** Farmer and pastoralist groups are trained on innovative climate smart agricultural/livestock practices keeping in mind health measures. The Directorate of Animal Health and National Institute of Agronomic Sciences of Burundi (ISABU will monitor compliance with this law and national standards through the analysis of the Environmental and Social Impact Assessments (ESIA).
14. Physical and Cultural Heritage	Law No. 1/6 of May 25, 1983 on the protection of the National Cultural Heritage.[70]	An asset classified as cultural heritage cannot be altered, degraded or destroyed; it is prohibited to use it for inscriptions, graffiti or displays. A classified property cannot be moved, notified, repaired, transformed or restored without the prior authorization of the Minister of Culture, taken on the assent of the Commission.	• **Activities 2.1.1.1 and 2.2.1.1:** Development of flood and drought scenarios takes into consideration protection of cultural heritage sites. • **Activities 2.1.2.1., 2.1.3.1., 2.1.3.2., 2.2.1.1, 2.2.3.2, 2.2.3.3., 2.2.3.5:** Construction of adaptation technologies (e.g. mobile flood barriers, storage facilities, irrigation system) takes into consideration the protection of cultural heritage sites. • **Activity 3.1.1.2:** Flood and drought management plans aim impact on cultural heritage sites.

[68] https://www.obpe.bi/images/pdf/cadreGestion.pdf
[69] https://www.obpe.bi/images/pdf/cadreGestion.pdf
[70] http://www.african-archaeology.net/heritage_laws/burundi1983.html

AF Principle	National text enacting the standard	Standard	Project relevance and compliance
			The Ministry in charge of culture in Burundi will monitor compliance with this law and national standards through validating that the execution of the programme does not go against Burundian culture.
15. Lands and Soil Conservation	Law No. 1/10 of June 30, 2000 on the Environmental Code of the Republic of Burundi (Titles III and IV).[71]	The preservation of soil against erosion is a national and individual ecological duty, and the measures to be taken to achieve this objective may be declared of public utility and be binding on any operator or occupant land (article 29).	• **Activity 2.1.1.2:** Adaptation benefits are determined from mobile flood barriers including preservation of soil against erosion. The flood barrier structure is designed prevent erosion. The Directorate General of Agriculture will monitor compliance with this law and national standards through the verification of the protection of the soil against any erosion by practices recognized by Burundian law. This department will ensure proper soil management in the project area.

UNEP´s Gender marker table

Code	Meaning	Criteria
0	Gender-blind	*Gender relevance is evident but not at all reflected in the project document.*
1	**Gender partially mainstreamed**	***Gender is reflected in the context, implementation, log frame, OR the budget***
2a	Gender well mainstreamed	*Gender is reflected in the context, implementation, log frame, AND the budget*

[71] https://www.obpe.bi/images/pdf/cadreGestion.pdf

2b	Targeted action on gender	*The main purpose of the project is to advance gender equality.*
N/A	Not applicable	*A gender analysis reveals that the project does not have direct interactions with and/or impacts on people, therefore, gender is considered not applicable.*

Table F.: Overview other relevant technical standards and compliance by project

Source	National text enacting the standard	Standard	Project relevance and compliance
	Law No. 1/03 of January 4, 2001 on the national system of standardization, metrology, quality assurance and testing.[72]	This law empowers the BBN to take charge of the standardization, metrology and quality assurance of all marketed products. The activities of the BBN are specified in joint ordinance No. 340 of 05/11/2013 on quality control of marketed products. This ordinance applies to products and goods imported or manufactured in Burundi.	• **Activity 3.1.2.5:** Farmers and pastoralists are trained on innovative climate smart agricultural extension services. These practices take into consideration the requirements set forth by BBN. The Burundian Bureau of Standardization and Quality Control "BBN" will monitor compliance with this law and national standards by verifying the quality of the products used in the execution of this project .

[72] https://www.obpe.bi/images/pdf/cadreGestion.pdf

Table G: Ongoing and planned initiatives related to flood and drought risk management in Burundi

Project/programme	*Objective(s)*	*Scope*	*(Non) Duplication/alignment*
1. Programme: Climate proofing food production investments in Imbo and Moso basins in the Republic of Burundi.[73] **Budget:** USD 31,721,500 of which USD 9,994,500 funded by the GCF. The accredited entity is the International Fund for Agricultural Development. **Project status:** Approved 2020	• Transforming current agro-ecological land and water management practices in the upper, middle, and lower Imbo and Moso catchments towards more sustainable and productive land use practices. • Build farmers' resilience to climate change in the upper, middle, and lower Imbo and Moso catchments and to increase agricultural productivity and food security through adoption of better agroecosystem management practices to conserve soil and water resources.	***Region*** Imbo and Moso basins ***Deliverables*** • Design and implement landscape management plans with farmers for soil and water practices. • Supporting capacity building and implementation of water harvesting structures. • Supporting improved post-harvesting activities. • Training of farmers in soil and water conservation practices.	***(Non) Duplication*** • Imbo basin is in scope but the Moso is not. • The flood and drought risk management plans include landscape management and soil and water practices; however, these take into account technologies as mobile flood barriers. • The programme implements harvesting structures at a large scale rather than on household level. • The programme implements a solar powered cold storage unit as part of post harvesting activities. ***Alignment*** • Floods will be prevented and water will be stored in a water harvesting structures to enhance water security. • Agroecosystem management practices will be implemented to increase agricultural productivity and food security through better to conservation of soil and water resources.
2. Programme: Community Disaster Risk Management in Burundi (*Bugesera,*	• Early warning systems (on climate change induced risks including new or emerging vulnerabilities and	***Region*** Bugesera, Mumirwa and Imbo Lowlands. ***Deliverables***	***(Non) Duplication*** • Both programs cover Bujumbura Rural Province which is in the Imbo Lowlands Region.

[73] https://www.greenclimate.fund/sites/default/files/document/sap017-ifad-burundi.pdf

Project/programme	Objective(s)	Scope	(Non) Duplication/alignment
Mumirwa and Imbo Lowlands regions)[74] **Budget:** USD 37,265,000 of which USD 8,715,000 funded by GEF. The implementing agency is United Nations Development Programme **Project status:** Approved 2014	hazards) established for communities. • Livelihoods and infrastructure risk assessment undertaken with gender-focused analysis. • Policy actions undertaken on the basis of anticipated climate change projections. • Flood Control in Bujumbura.	• Community Based Early Warning System on climate change related risks in Bujumbura Rural, Kirundo and Makamba Provinces. • Hydrometeorological network and improving capacity to generate real-time information weather and data series for information dissemination to target communities. • Effective and efficient communication and dissemination system to reach all end users. • Gender and climate vulnerability assessment to guide the development of a local climate change response. • Stabilization works undertaken in Ntahangwa and Gaseyni Rivers to reduce the risk of flooding landslides in Bujumbura City.	• The programme implements flood and drought early warning hard- and software. Gap analyses will be conducted to prevent duplication. • The programme implements knowledge and information sharing system. Gap analyses will be conducted to prevent duplication. • The programme conducts risk assessments and benefit analyses. However, the assessments are conducted using innovative software and considering innovative response measures such as mobile flood barriers. ***Alignment*** • Implementation of information services including flood and drought early warning systems. • Adaptation benefits mechanism is developed and applied to perform flood and drought risk analyses and interventions are designed to support vulnerable groups. • The impact of climate change on flood and drought risks are analysed and corresponding adaptation actions are designed and incorporated in policies and plans. • Flood control structures will be implemented in Bujumbura to enhance resilience to floods.
3. Programme: Restructuring of the Value Chain	• Contribute to increasing incomes and improving the food	***Region***	***(Non) Duplication*** • The programme also covers Cibitoke and Bubanza Province.

[74] https://www.thegef.org/projects-operations/projects/4990

Project/programme	*Objective(s)*	*Scope*	*(Non) Duplication/alignment*
Development Programme (PRODEFI)[75] **Budget:** USD 44,900,000 of which USD 36,600,000 is funded by IFAD and USD 4,900,000 by ASAP and USD 3,100,000 by the national government. **Project status:** Approved 2015	security and nutrition of poor households in a sustainable manner in areas of intervention by strengthening priority agricultural sectors (rice and milk). In addition, enhance the resilience of production systems and the facilitation of a sustainable partnership with public, private and civil society institutions.	Bubanza, Cibitoke, Gitega, Karusi, Kayanza, Muramvya and Ngozi Province. ***Deliverables*** • Irrigation schemes and infrastructure. • Design of rural engineering structures to climate variability. • Intensification of agricultural production. • Support to priority sectors	• The programme implements irrigation schemes/infrastructure, but with different technologies. The programme utilizes temporary barriers to harness flood water. • The programme designs and executes engineering activities. PRODEFI "merely" build capacities and set (technical) standards. • The programme improves agricultural production through smart practices and software; PRODEFI focused on seeds, fertilizers etc. ***Alignment*** • Implementation of water harvesting infrastructure and an irrigation system to strengthen water security in line with technical standards. • Reshaping of rural land to optimise the habitability and land productivity especially for the priority sectors. • Capacity building of different stakeholder groups to improve skillset to enhance resilience to floods and drought using innovative adaptation practices, tools and technologies.
4. Programme: Burundi Landscape Restoration Project[76]	• Restore degraded landscapes by community members in two priority regions,	***Region*** (North-West region) Bubanza, Kayanza, Bujumbura Rural, (East	***(Non) Duplication*** • The programme also covers Bubanza and Bujumbura Rural Province.

[75] https://www.ifad.org/documents/38711624/40089492/PRODEFI+II+Rapport+de+conception+dtaille.pdf/6b0c1812-9550-4763-9d46-a26dc6ce7b73?t=1611227252000

[76] https://documents1.worldbank.org/curated/en/408471487004538339/pdf/ITM00184-P160613-02-13-2017-1487004534488.pdf

Project/programme	Objective(s)	Scope	(Non) Duplication/alignment
Budget: USD 63,500,000 of which USD 50,000,000 is funded by International Development Association (IDA) and USD 13,500,000 by Least Developed Countries TF for Climate Change Activities. The implementing agency is the Ministry of Water Environment Land and Urban Planning. **Project status:** Approved 2016	and in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency.	region) Cankuzo, Ruyigi and Muyinga Province ***Deliverables*** • Strengthened role of traditional and local institutions in landscape restoration. • Enhanced access to improved climate information and early-warning systems. • Investments in restoration of degraded lands and support ecosystem-based adaptation.	• The programme will conduct capacity building of local institutions, though not specifically on land restoration; it will focus on land use management in light of flood and drought management. • The programme will enhance/implement early warning systems and improve access. It is unclear to what extent this element is overlapping; gap analyses are conducted to prevent duplications. • This programme invests in restoration and adaptation, however using different practices, tools and technologies. The completed project focused more on nature-based solutions. ***Alignment*** • Enhance resilience to floods and drought along catchments using information services and other technologies such as flood barriers. • Smart agriculture practices are implemented to restore land productivity and prevent loss of productivity due to floods and drought. • Capacity building of institutions to improve skillset required to restore landscapes after a flood or drought event.
5. Programme: Natural Landscapes Rehabilitation and Climate Change Adaptation in the Region of Mumirwa in Bujumbura and	Address the root causes of landscape degradation due to climate change and unsustainable land uses by rehabilitating degraded land and adapting integrated farming and	***Region*** Region of Mumirwa in Bujumbura Mairie and in the Lake Tanganyika coastal area. ***Deliverables***	***(Non) Duplication*** • The programme covers Bujumbura Marie and part of the Lake Tanganyika coastal area. • The programme identifies, prioritizes, implements, monitors and evaluates adaptation strategies, but centred around new adaptation measures.

Project/programme	*Objective(s)*	*Scope*	*(Non) Duplication/alignment*
Mayor of Bujumbura through a Farmer Field School Approach[77] **Budget:** USD 23,277,397 of which USD 5,877,397 is funded by GEF, USD 7,000,000 by IFAD - EU Millennium Development objective achievement acceleration project (PROPA-O), USD 1,000,000 by GIZ Project to improve land management and governance, USD 2,600,000 by NED National Programme of Agricultural inputs in Burundi and USD 5,500,000 by BUR National Programme of Agricultural inputs in Burundi. **Project status:**	natural systems to climate change in the.	• Training to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures. • Risk and vulnerability assessments and relevant technical assessments carried out and updated. • Institutional arrangements to lead, coordinate and support the integration of climate change adaptation (CCA) into relevant policies, plans and associated processes. • Type and extent of assets strengthened and/or better managed to withstand the effects of climate change. • Number of people/ geographical area with access to improved climate information services.	• The programme conducts risk assessments, albeit with state-of-the-art modelling software and considering new adaptation measures. • The programme establishes MoUs/agreements between stakeholder and reviews and amends policies, plans and processes taking into account new adaptation measures (e.g. mobile barriers). • The programme enhances resilience of assets to climate change but with new adaptation measures. • The programme enhances communities' access to flood and drought information services but using different channels e.g. APIs. ***Alignment*** • Capacity building of different stakeholder groups to improve skillset to enhance resilience to floods and drought using new adaptation measures. • Climate-smart practices and flood resilient measures, such as flood barriers, to protect ecosystems in a sustainable manner. • Deployment of water-filled barriers to prevent flooding and enable land reclamation. • Promotion of agricultural and livestock practices to adapt to climate change impacts.

[77] https://www.thegef.org/projects-operations/projects/8010

Project/programme	Objective(s)	Scope	(Non) Duplication/alignment
Approved 2019			
6. Programme: Consultancy to support delivering climate resilient and sustainable water services to rural communities in Burundi.[78] **Budget:** T.b.d. funded by GCA. **Project status:** Planned 2023	Provide technical assistance: (a) to undertake a climate risk assessment in five provinces in Burundi with a focus on water resources, and water service delivery assets; and, (b) to provide technical inputs into the design of measures for climate-resilient catchment management and into the mitigation of climate risk to water service delivery assets.	***Region*** • Five (undisclosed) provinces. ***Deliverables*** • A rapid risk assessment – desk-based using available data - to identify climate change hotspots in the five select provinces in Burundi. • In-depth assessment of risks stemming from climate change for the identified hotspot catchments. • Identify suitable adaptation measures for catchments and provide technical assistance to design measures that combine grey, green and social investments.	***(Non) Duplication*** • Although undisclosed, the four provinces of the programme are expected to be in scope of the planned programme. • The programme conducts a risk assessment limited to flood and drought risk using newly developed intelligence software. The programme does not conduct in-depth risk assessments. • The programme identifies and implements adaptation measures, however not focused on nature-based solutions. The programme implements new adaptation measures such as mobile flood barriers. ***Alignment*** • The programme aims to enhance resilience to climate change in the water sector with a distinct focus on floods and drought. • The programme conducts flood and drought risk assessment early-stage. • The program designs and implements adaptation measures to enhance resilience.
8. Programme: Great Lakes Regional Integrated Agriculture	• To increase agricultural productivity and commercialization in targeted areas in the territory of the recipient	***Region*** • Ruzizi Plain and the Imbo region, and the geographic corridor along Lake Tanganyika	***(Non) Duplication*** • The programme covers (parts of) the Ruzizi Plain and the Imbo region.

[78] https://gca.org/wp-content/uploads/2022/08/GCA-PR-22-184-REOI-Climate-Resilient-and-Sustainable-Water-Services-in-Burundi-_Final95.pdf

Project/programme	Objective(s)	Scope	(Non) Duplication/alignment
Development Project.[79] **Budget:** USD 79,730,000 of which USD 75,000,000 by World Bank Financing (IBRD/IDA) and USD 4,730,000 by local beneficiaries. **Project status:** Approved 2017	and improve agricultural regional integration. • To provide immediate and effective response in the event of an eligible crisis or emergency.	***Deliverables*** • Facilitate farmers' access to improved production packages (e.g. seed). • Promote the adoption of climate smart agriculture. • Rehabilitate irrigation infrastructure and • Strengthen capacity of water user associations to manage irrigation systems and improve watershed management. • Strengthening of selected Business Development Services (BDS) (to support value chains). • Exchanges of information, knowledge, and technologies through channels such as a web-based exchange platform.	• The programme implements smart agriculture practices supported by innovative software, though without improving access to production packages. • The programme will implement an irrigation infrastructure, though in a unique setup where excess flood water is harnessed using mobile flood barriers. • The programme conducts capacity building of people and institutions, though focused on the new adaptation practices, tools and technologies. • The programme supports linkages with potential buyers of agriculture and livestock products but also by emphasizing used of new adaptation measures. • The programme implements knowledge sharing and learning using different channels, though focussed on new adaptation measures. ***Alignment*** • The programme aims to enhance agricultural productivity and commercialization in the same region. The programme does this with a unique set of adaptation measures. • Both programmes aim to enhance emergency response in case of crisis situations. The proposed programme focusses on flood and drought crisis situations. The programme furthermore promotes the usage a unique adaptation measures including mobile flood barriers.

[79] https://projects.worldbank.org/en/projects-operations/document-detail/P161781?type=projects

Project/programme	*Objective(s)*	*Scope*	*(Non) Duplication/alignment*
9. Programme: Transport Resilience Project[80] **Budget:** USD 65,000,000 of which USD 65,000,000 by World Bank Financing (IBRD/IDA). **Project status:** Approved 2020	• To facilitate efficient, safe and sustainable movement of people and goods along targeted roads and improve the capacity of the road sector in Burundi.	***Region*** • The Project's area of intervention covers the city of Bujumbura, the commune of Kabezi in Bujumbura Rural Province and the commune of Muhuta in Rumonge Province. ***Deliverables*** • Number of people with enhanced access to markets and transport facilities. • Number of farmers benefitting from improved access to markets. • Annual number of days movement of people and goods interrupted due to climatic conditions • Authorities use of road database and climate information for annual road maintenance planning	***(Non) Duplication*** • The programme covers four provinces including Bujumbura. • The programme aims to make roads more accessible by preventing damages from floods; however, the programme applies different technologies such as a mobile flood barrier. • The programme improves access to markets for farmers; however, using different technologies and strategy. The programme will improve the cold chain and ensures that logistics are in place for buyers to purchase food products from farmers. • The programme will produce climate information which can also be used for road safety, though limited to weather data. ***Alignment*** • The programme aims to enhance farmers' access to markets in the same region. The programme does this with a unique set of measures. • Both programmes aim to facilitate efficient, safe and sustainable movement of people and goods. The proposed programme, however, focusses on flood and drought prevention and applies technologies such as a flood barrier which is temporary in nature.
10. Programme: Emergency agricultural	• To strengthen the food security of the Burundi population (M/F) in the	***Region*** • The project's direct beneficiaries are estimated at	***(Non) Duplication***

[80] https://documents1.worldbank.org/curated/en/186601608288939897/pdf/Concept-Project-Information-Document-PID-TRANSPORT-RESILIENCE-PROJECT-P172988.pdf

Project/programme	Objective(s)	Scope	(Non) Duplication/alignment
production project in Burundi[81] **Budget:** USD 4,443,301 of which USD 4,000,000 by Transition Support Facility (TSF) and USD 443,301 by the government. **Project status:** Approved 2022	face of the global crisis. Specifically, it aims to: (i) intensify cereals production (maize and rice) using climate-resilient varieties; (ii) promote digitization to support farmers and ensure transparency and inclusiveness, particularly with regard to seeds and plant protection products; and (iii) promote gender-sensitive policies by facilitating access to agricultural inputs.	over 48,000 households or about 255,000 people (60% women) living in 14 provinces of the country. ***Deliverables*** • Increase agricultural production, food security and farmers' incomes through support for agricultural input (resilient and high yield seeds, organic-mineral fertilizers, and plant protection products) availability. • Support for Gender-Sensitive Policies targeting Access to Agricultural Inputs.	• The programme covers 4 provinces in the Imbo Basin that are also in the regional scope of the "Emergency agricultural production project". • The programme will advise on crops production and the implementation adaptive practices but will not procure seeds and fertilizers. • The programme will include gender considerations in policies / plans that are developed as part of this programme. The Emergency agricultural project focuses on updating of the gender-sensitive National Agricultural Investment Plan (PNIA.3). ***Alignment*** • Both programmes aim to strengthen food security through improvements in agricultural production. The proposed programme doesn't go as far when it comes to implementation of new crops production, but there is potential to align so that the other programme takes over where the proposed programme stops.
11. Programme: Bujumbura port and Lake Tanganyika transport corridor development Project[82] **Budget:** USD 36,790,000 of which USD	• To (i) increase the capacity and efficiency of Bujumbura (Burundi) and Mpulungu (Zambia) ports so as to improve regional connectivity; (ii) boost regional trade along the integrated Lake Tanganyika	***Region*** • The entire Lake Tanganyika basin. ***Deliverables*** • Improved of ports through civil works. • Improved access roads to the ports.	***(Non) Duplication*** • The programme is within the Tanganyika basin, albeit for one country only i.e., Burundi. • Both programmes aim to improve access to roads and infrastructure for actors in the agricultural value chain. The proposed programme uses repressive measures that are temporary in nature as opposed to the other programme that uses permanent solutions.

[81] https://www.afdb.org/en/documents/burundi-emergency-agricultural-production-project-project-appraisal-report

[82] https://www.afdb.org/en/documents/multinational-lake-tanganyika-transport-corridor-development-project-phase-i-rehabilitation-bujumbura-port-project-appraisal-report

Project/programme	Objective(s)	Scope	(Non) Duplication/alignment
14,070,000 through ADF Grant, USD 4,940,000 through TSF Grant, USD 16,020,000 through EU Grant and USD 1,760,000 by the government. **Project status:** Approved 2019	corridor and interconnect with existing regional trade corridors; and (iii) improve living conditions for the population in the project area.	• Environmental and Social Management Plan (ESMP) implementation and climate change adaptation measures identified.	• The proposed programme implements climate adaptation measures as opposed to "just" identifying such measures. ***Alignment*** • It's worth exploring what the role of temporary flood barriers could be in the Bujumbura port and Lake Tanganyika transport corridor development Project. • The proposed programme takes into account the improvements to the ports and access roads when exploring transportation of food products. • The proposed programme implements adaptation measures that could be part of the ESMP of the other programme.
12. Programme: The Agricultural Production Intensification and Vulnerability Reduction Project.[83] **Budget:** USD 101,007,000 of which USD 27,490,000 by IFAD, USD 25,000,000 by OPEC Fund, USD 7,000,000 by WFP, USD 20,000,000 by	• To improve the living conditions and climate resilience of rural populations in Burundi's central plateau through an integrated land management approach involving the optimal use of natural resources tailored to growing population pressure. The development objective is the sustainable growth of agricultural	***Region*** • The provinces of Karuzi, Kayanza, Ngozi, Gitega and Muyinga. ***Deliverables*** • Improved agricultural land management such as wetland management. • Improved connectivity and infrastructure for value enhancement.	***(Non) Duplication*** • The proposed programme a different region. • Both programmes improve agricultural land; however, the proposed programmes implement innovative measures that are temporary in nature as opposed to the permanent interventions from the other project. • The proposed programme also improves connectivity and infrastructure though with different measures such as a water-filled barrier and solar powered cold storage. • Both programmes focus on capacity building; however, the proposed programme covers a unique combination of adaptation measures in the capacity building plan.

[83] https://webapps.ifad.org/members/eb/125/docs/EB-2018-125-R-33-Rev-1.pdf?attach=1

Project/programme	*Objective(s)*	*Scope*	*(Non) Duplication/alignment*
AfDB and USD 11,630,000 by the government. **Project status:** Approved 2018	productivity and production and the diversification of economic opportunities in rural areas.	• Inclusive community development and capacity-building. • Support to cooperatives for value enhancement, diversification of production and microenterprise development.	***Alignment*** • The regions are different, and the specific measures are also not the same, however the overall objective shows a lot of similarities. The proposed programme can likely take on lessons from "the Agricultural Production Intensification and Vulnerability Reduction Project".

Table H.: Mapping* of projects with complementary interventions

Programme outcome	*Cibitoke*	*Bubanza*	*Bujumbura Rural*	*Bujumbura Mairie*
Outcome 1.1: Increased usage of effective information technology by stakeholders.	P3, P6	P3, P4, P6	P2, P4, P6, P7, P9	P6, P9
Outcome 2.1: Increased uptake and usage of concrete and innovative flood adaptation actions.	P1, P3, P5	P1, P3, P5	P1, P2, P5, P7	P1, P5
Outcome 2.2: Increased uptake and usage of concrete and innovative drought adaptation actions.	P1, P3, P5, P8	P1, P3, P5, P8	P1, P2, P5, P7, P8, P9	P1, P5, P8, P9
Outcome 3.1: Strengthened awareness and ownership of flood and drought adaptation and climate risk reduction processes at local level.	P3, P5, P6, P8, P10	P3, P5, P6, P8, P10	P2, P5, P6, P7, P8, P10	P5, P6, P8, P10

** "P" in the table refers to the programme numbers in Table G*

Table I.: Overview knowledge management strategy

Expected Outputs	Type of knowledge	Beneficiaries/activities	Expected results/knowledge products
Output 1.1.1: Efficient and effective flood and drought information technology and services implemented.	• Analysis of and experience with current flood and drought information technology and services. • Analysis of and experience with new flood and drought information technology and services.	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at national, regional and local level. • Disaster management authorities at national, regional and local level. ***Activities*** • Tailored workshops provided by the IT-provider • Travel from and to the IT-provider • Interviews/surveys organised by the programme to conduct a needs assessment. • Knowledge sharing platform (e.g., SharePoint) to accessible by the beneficiaries.	***Results*** • Shared understanding on how to enhance flood and drought information technology and services. • Local knowledge is enhanced on how to benefit from flood and drought information technology and services. ***Knowledge products*** • Design plans flood and drought information technology and services • Training plans/documents • Lessons learned documents
Output 1.1.2: Flood and drought management plans established at national and sub-national level.	• Analysis of and experience with current flood and drought emergency response plans. • Analysis of and experience with new flood and drought emergency response plans.	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at national, regional and local level. • Disaster management authorities at national, regional and local level. ***Activities*** • Tailored workshops with experts to assess current flood and drought emergency plans and determine what is missing.	***Results*** • Shared understanding on how to establish and improve flood and drought emergency response plans. • Knowledge on processes and roles and responsibilities in flood and drought emergency response is enhanced. ***Knowledge products*** • Emergency response plans • Flood and drought information sharing platform

Expected Outputs	Type of knowledge	Beneficiaries/activities	Expected results/knowledge products
		• Interviews/surveys with writers and users of emergency plans. • Knowledge sharing platform to store plans and gather recommendations and lessons learned.	• Training plans/documents • Lessons learned documents
Output 2.1.1: Flood risks analysed, and flood adaptation actions designed.	• Analysis of flood risks and possible adaptation interventions. • Analysis of and experience with current flood risk adaptation interventions. • Analysis of and experience with new flood risk adaptation practices, tools and technologies.	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at national, regional and local level. • Disaster management authorities at national, regional and local level. • Other governmental bodies such as the Ministry of Environment, Agriculture and Livestock. ***Activities*** • Meetings to understand how flood risks are analyses and mitigated. • Tailored workshops led by different experts to assess how flood risks are analysed and mitigated. • Travel to fields to observe the areas and triangulate with outcome meetings and workshops. • Interviews/surveys of beneficiaries including local community members and vulnerable groups. • Centralized knowledge sharing platform accessible to beneficiaries to share lessons learned.	***Results*** • Shared understanding and increased awareness of flood risks. • Shared understanding of how to implement and improve upon innovative flood adaptation practices, tools and technologies. • Increased knowledge of processes and roles and responsibilities concerning new flood adaptation interventions. ***Knowledge products*** • Flood risk assessment • Flood adaptation benefit analysis • Flood information sharing platform • Training plans/documents • Lessons learned documents

Expected Outputs	Type of knowledge	Beneficiaries/activities	Expected results/knowledge products
Output 2.1.2: Innovative water-filled mobile flood prevention structures constructed.	• Analysis of and experience with facilities (storage, infrastructure, transportation) to deploy mobile flood barrier. • Analysis of and experience with how mobile usage of a mobile flood barrier to prevent erosion.	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at local level. • Disaster management authorities at local level. ***Activities*** • Meetings with authorities and beneficiaries to implement flood resilient structures approved by the relevant authorities. • Travel to the locations before and during the construction and implementation of the structures. • Tailored workshops involving experts, beneficiaries and authorities to ensure smooth construction and share experience with the structures. • Centralized knowledge sharing platform accessible to beneficiaries to share lessons learned.	***Results*** • Shared understanding of optimal usage of facilities to support the deployment of a mobile flood barrier. • Shared understanding of how to use a mobile flood barrier to prevent erosion. ***Knowledge products*** • Flood situation analysis report • Flood adaptation guidelines • Training material flood adaptation • Lessons learned document
Output 2.2.1: Drought adaptation tools, technologies and practices designed..	• Analysis of drought risks and possible adaptation interventions. • Analysis of and experience with current drought risk adaptation interventions. • Analysis of and experience with new drought risk	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at national, regional and local level. • Disaster management authorities at national, regional and local level. • Other governmental bodies such as the Ministry of Environment, Agriculture and Livestock.	***Results*** • Shared understanding and increased awareness of drought risks. • Shared understanding of how to implement and improve upon innovative drought adaptation practices, tools and technologies.

Expected Outputs	Type of knowledge	Beneficiaries/activities	Expected results/knowledge products
	adaptation practices, tools and technologies.	***Activities*** • Meetings to understand how drought risks are analyses and mitigated. • Tailored workshops led by different experts to assess how drought risks are analysed and mitigated. • Travel to fields to observe the areas and triangulate with outcome meetings and workshops. • Interviews/surveys of beneficiaries including local community members and vulnerable groups. • Centralized knowledge sharing platform accessible to beneficiaries to share lessons learned.	• Increased knowledge of processes and roles and responsibilities concerning new drought adaptation interventions. ***Knowledge products*** • Drought risk assessment • Drought adaptation benefit analysis • Drought information sharing platform • Training plans/documents • Lessons learned documents
Output 2.2.2: Drought resistant agriculture practiced.	• Analysis of and experience with individual/communal practices to adapt to drought. • Analysis of and experience with agricultural and pastoralist practices to adapt to drought.	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at local level. • Disaster management authorities at local level. ***Activities*** • Meetings with beneficiaries to understand the experience with drought resilient measures and share these with other (potential) beneficiaries. • Tailored workshops to receive and share feedback from beneficiaries and develop recommendations.	***Results*** • Increase knowledge of optimal individual/communal practices to adapt to drought. • Increased knowledge of optimal agricultural and pastoralist practices to adapt to drought. ***Knowledge products*** • Drought response guidelines • Drought response runbook • Training material

Expected Outputs	Type of knowledge	Beneficiaries/activities	Expected results/knowledge products
		• Centralized knowledge sharing platform accessible to beneficiaries to share lessons learned.	
Output 3.1.1: Good practices and lessons on flood and drought management documented and disseminated.	• Analysis of and experience with current sharing and dissemination of lessons on flood and drought management. • Analysis of and experience with current sharing and dissemination of lessons on flood and drought management.	***Beneficiaries*** • Local communities (incl. farmers and pastoralists) • Hydro/meteorological departments at national, regional and local level. • Disaster management authorities at national, regional and local level. • Other governmental bodies such as the Ministry of Environment, Agriculture and Livestock. ***Activities*** • Meetings to discuss how lessons learned related to flood and drought management takes place. • Tailored workshops with experts to discuss lessons learned sharing and dissemination and discuss possible improvements. • Interviews/surveys with individuals to garner experiences with lessons learned sharing. • Knowledge sharing platform to enable effective knowledge sharing and dissemination.	***Results*** • Shared understanding on how to establish and improve sharing lessons on flood and drought management. ***Knowledge products*** • Knowledge sharing guidelines • Flood and drought information sharing platform • Training plans/documents • Lessons learned documents

Table J.: Overview participants consultations for the Concept Note

N°	Name	Institute	Function	Gender	Phone Number	E-mail
Local and regional government						
1	NZIGIYIMANA Cléophas	Province Bubanza	Gouverneur	M	69682822	
2	NIBITANGA Nadine	Commune	Administrator	F	61 445 234	
3	BUCUMI Gérard	Commune Mpanda	Executive Secretary Permanent	M	69220521	
Technical experts						
4	NINDAMUTSA Astère	Institut géographique du Burundi (IGEBU)	Technical Advisor of the Director General	M	79431939	rntiharirizwa@gmail.com
5	NGENZIRABONA Augustin	Institut géographique du Burundi (IGEBU)	Director General	M	79 431 955	augungenzi@yahoo.fr
6	HATUNGIMANA Berchmans	Office Burundais pour la Protection de l'Environnement (OBPE)	Director General	M	69177962 / 79812477	hatungimanaberchmans@yahoo.fr
7	MURENGERANTWARI Janvier	Office Burundais pour la Protection de l'Environnement (OBPE)	Technical Advisor of the Director General	M	79307824	janviermurengerantwari@ymail.com
8	NDAYIZEYE Liévin	Office Burundais pour la Protection de l'Environnement	Designated National Authority for the Adaptation Fund	M	79 697 988	ndayizeyelievin@yahoo.com
9	NIYIMPAYE Philippe	Commune Mpanda	Municipal Agronomist	M	69701352	
10	MBONIMPA Joseph	Commune Mpanda	Zonal Agronomist	M	69080326	
11	NDIKUBAGANWA Emmanuel	Ministère de l'Environnement Agriculture et Elevage	Head of the Provincial Office of the Environment, Agriculture and Livestock (BEPAE)	M	69 481 533	
12	HABARUGIRA Hussein	Office Burundais pour la Protection de l'Environnement	Head of Bubanza Branch	M	79974102	
Parliament						
13	NIBIZI Epimeny	Assemblée nationale	Parliamentary responsible for the parliamentary group in charge of the environment sector	M	69691224	niepys@yahoo.fr

Indigenous people						
14	Hon.NENGO Emmanuel	Unissons –nous pour la Promotion des Batwa (peuples autochtones)	Legal Representative	M	*79 94 65 78*	emmanengo@yahoo.fr
Environmental protection						
15	Mugani Christine	Association Protection des Ressources Naturelles pour le Bien Etre de la Population au Burundi (APRN/BEPB)	Member	F	76570748	muganichristine@gmail.com
16	NGEZAHAYO Belyse Elodie	Association Protection des Ressources Naturelles pour le Bien Etre de la Population au Burundi (APRN/BEPB)	Member	F	62065658	belodie016@gmail.com
17	DUSHIME Chanelle	Association Conservation et communauté de Changement	Chargé des programmes	F	79478927	chanelledushi@gmail.com
Local community						
18	NTUKAMAZINA J.M Vianney	Agriculteur modèle	Model Farmer on Rubira Hill	M	68 073 456	jeanmpita64@gmail.com
19	RUBERINTWARI Aloys	Coopératives agricoles	Representative of Farmers	M	69 158 921	
20	NIKIZA Alexis	Association Protection des Ressources Naturelles pour le Bien Etre de la Population au Burundi (APRN/BEPB)	General Director	M	79 916 628	nikiza07@yahoo.fr
21	NDUWAYO Léonidas	Association Protection des Ressources Naturelles pour le Bien Etre de la Population au Burundi (APRN/BEPB)	Chargé des programmes de l' APRN/BEPB	M	71 987 721	nduwayoleonidas@yahoo.fr
Women's organizations						
21	NZOHABONIMANA Felicissima	Care Burundi	Gender and Community Development Expert	F	79 493 431	felicissimanzohabonimana@gmail.com
Agricultural Sector						
22	NZOBANDORA Eliphaz	ELAGA	Expert in Planning and Hydrology	M	79 430 997	nzoeliphaz@yahoo.fr/nzoelphaz@gmail.com
Media						

23	MAHEBURWA Gaspard	Radio TV Buntu- The Voice of Orphans and Widows	Director	M	79 491 778	gmaheburwa@gmail.com
24	NGENDAKUMANA Evrard	Reuters	Journalist	M	61100697	evarudo@gmail.com
Research institutions						
	MBARUSHIMANA Didier	Ecole Doctorale Université du Burundi	Researcher on landscape dynamics	M	79352590	mbardi05@gmail.com
	NDAYIKEZA Longin	Ecole Doctorale Université du Burundi	Biodiversity Researcher	M	62508720	ndayilkeza2009@gmail.com
UNEP, UN regional offices and Country teams						
	Eva Comba	UNEP	Climate Change Adaptation Unit– Programme manager	F	+254207623434	Eva.comba@un.org
	Rajiv Garg	UNEP	CTCN Director (a.i)	M	+34663976529	gargr@un.org
	Richard Munang	UNEP	Deputy Regional Director	M	+254 207625727	richard.munang@un.org
	Jean Jacob Sahou	UNEP	Regional Development Coordination Officer	M	+254 207625727	jean-jacob.sahou@un.org
	Jessica Troni	UNEP	Climate Change Adaptation Unit - Senior Manager	F	+254 207625727	jessica.troni@un.org

Table K: Overview consultations and number of participants

Key stakeholder	*Partnership 1*	*Partnership 2*	*Partnership 3*	*Partnership 4*
(i) Customers				
1. Produce export traders	✓			✓
2. Smallholder farmers	✓	✓	✓	✓
3. Pastoralists	✓	✓	✓	
4. Representatives of agricultural cooperatives		✓	✓	✓
(ii) Community				
5. Farmer families (community)	✓	✓	✓	✓
6. Women's association	✓	✓	✓	✓
7. Indigenous peoples	✓	✓	✓	✓
8. Civil society	✓	✓	✓	✓
(iii) Partners				
9. Environmental expertise/field	✓			
10. Agricultural industries			✓	✓
11. Extension agents (e.g. training institutes)			✓	✓
(iv) Institutions				
12. Disaster preparedness and management	✓	✓		
13. Burundi Hydro Meteorological Department (BHMD)	✓			
14. Environmental protection department		✓		
15. Agriculture and Livestock Research Institution		✓	✓	✓
16. Provincial Technical Services (Agriculture and Livestock)	✓	✓	✓	✓
17. Territorial administration		✓		
18. Local government	✓	✓		
19. Regional/provincial government	✓	✓		
20. Grant funder	✓			✓
21. Financial institutions (incl. insurer)	✓	✓		
22. Embassy of the Netherlands in Burundi		✓		
23. University of Burundi		✓	✓	
24. University in the Netherlands		✓	✓	
25. UNEP	✓			

Definitions:

- *Customers: Individuals or entities who buy or pay for your products/services*
- *Community: Local community members benefiting from the partnership*
- *Partners: Individuals or entities working with the partners*
- *Institutions: Institutions providing an enabling environment for the partnership*

Table L.: Outcome scoring matrix mitigation measures

	Relevance			Effectiveness			Sustainability				Efficiency		Impact			
	Sensitive to situation	Partner/ institution	Beneficiaries	Goals and needs (floods)	Goals and needs (other)	Added benefits	Environmental	Financial (maintenance)	Technological	Institutional/ social	Cost-effectiveness	Time- effectiveness	Extent	Long-term	Total	Score out of 10
1. SLAMDAM	3	2	2	2	2	3	2	3	3	3	2	3	1	2	33	7.857
2. Development of drainage systems	3	3	3	3	1	2	3	1	2	3	2	1	2	2	31	7.381
3. Excavation/ widening of river bed	3	1	1	3	1	0	1	0	1	1	1	1	2	2	18	4.286
4. Retarding Basin/ Pond	2	2	2	2	2	1	1	2	2	2	1	2	2	2	25	5.952
5. Infiltration area	2	2	2	1	3	3	3	2	2	2	1	1	1	3	28	6.667
6. Sandbags	3	1	2	1	0	1	2	2	1	2	2	3	0	1	21	5.000
7. Forestation	1	3	3	1	3	3	3	3	2	3	2	0	1	3	31	7.381
8. Flood early warning system (FEWS)	2	3	2	1	0	2	3	1	2	2	3	3	3	2	29	6.905
9. Flood Hazard map	3	2	1	1	1	1	3	2	2	2	3	2	3	2	28	6.667

Score	
0 =	Bad
1 =	Low
2 =	High
3 =	Very high

Table M.: Checklist environmental and social risks and compliance with the ESP

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
1. *Compliance with the Law*	Risk that the programme does not comply with applicable domestic and international laws due to lack in (1) capacity or willingness to adhere to laws caused by inadequate expertise, resources to take the necessary actions or control thereof.	N/a	***Risk chance*** Low probability as most programme activities are not bound by laws. ***Risk potential impact*** Very high seeing that in adherence to laws can result in a cancelation of the programme. ***Further assessment and management*** Additional assessment is needed to describe the legal and regulatory framework for any activity that may require prior permission. Actions shall be defined how to comply with these laws
2. *Access and Equity*	Risk that the programme does not provide fair and equitable access to benefits due to an improper process to allocate and distribute programme benefits caused by project implementation arrangements that are not inclusive.	***Risk chance*** Very low probability as most benefits cannot be allocated to specific groups. ***Risk potential impact*** High seeing as this could impede access of any group to the essential services and rights. ***No further assessment*** The intervention logic of the programme is to provide benefits to the vulnerable groups, with fair and equitable access to activities, equipment, resources, and training throughout the planning and execution phases. The programme involves marginalized groups and sets	N/a

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		benefit targets for these groups and monitors realisation of benefits. The inherent risk is low and measures are already in place to ensure compliance.	
3. *Marginalized and Vulnerable Groups*	Risk that the programme imposes disproportionate adverse impacts on marginalized and vulnerable groups due to a lack of consideration caused by improper identification of these groups or inadequate involvement in the programme.	N/a	***Risk chance*** Very low probability as the programme aims to help marginalized and vulnerable groups improve their living conditions and quality of life. ***Risk potential impact*** High seeing as adverse impacts would deteriorate the wellbeing of marginalized and vulnerable groups and exacerbate the equality gaps. ***Further assessment and management*** Inherent risk is low, yet further assessment helps clarify possible impacts on marginalized and vulnerable groups. The programme shall describe characteristics of marginalized groups and possible adverse impacts. The programme involves these groups in consultations and the co-design process.
4. *Human Rights*	Risk that the programme does not respect international human rights due to a shortcoming in creating awareness in the programme caused by not explicitly discussing human rights with stakeholders during consultations.	N/a	***Risk chance*** Low probability as the programme addresses human rights during consultations. ***Risk potential impact***

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
			Very high seeing as human rights violations are detrimental for the wellbeing of people whom the programme is trying to help. Violations can also lead to a cancellation of the programme. ***Further assessment and management*** The programme shall identify relevant human rights issues for Burundi that are cited in the Human Rights Council Special Procedures. Human Rights issues are explicitly part of the consultations. The programme shall ensure compliance with Universal Declaration of Human Rights (UDHR).
5. *Gender Equity and Women's Empowerment*	Risk that women and men (1) don't have equal opportunities, (2) receive comparable benefits or (3) suffer adverse effects disproportionately due to improper identification of opportunities, benefits adverse effects per gender caused by not involving either gender adequately in the programme.	N/a	***Risk chance*** Very low probability as the programme aims to help women improve their living conditions and quality of life. The programme activities often lack in the ability to discriminate either gender. ***Risk potential impact*** High seeing as adverse impacts could deteriorate the wellbeing of women and exacerbate the gender gap. ***Further assessment and management*** The chance of an issue is very low, yet further assessment helps clarify how the programme prevents excluding or hampering of a gender group and exacerbating or maintaining of the

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
			gender gap. The assessment for this principle includes: (1) An analysis of the legal and regulatory context, (2) ensuring equal participation in the programme and (3) adverse impacts per gender and corresponding mitigating measures. The programme ensures involvement of all genders in consultations and the co-design process.
6. *Core Labour Rights*	Risk that the programme does not meet core labour standards as identified by the International Labour Organization (ILO) due to lack in capacity or willingness to implement ILO standards caused by not involving experts or assigning responsibilities when designing and implementing the programme.	N/a	***Risk chance*** Very low probability as the programme has relatively little involvement of local labour throughout the programme, even though the programme aims to enhance job security and the economy. ***Risk potential impact*** High seeing as adverse impacts could deteriorate the rights of labourers. Violation of ILO standards can lead to cancellation of the programme. ***Further assessment and management*** Despite that the risk is chance of an issue is low, an assessment is needed to identify how the programme could violate ILO standards and what measures are in place to prevent that from happening. ILO core labour standards shall be incorporate in the design and implementation of the programme.

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
7. *Indigenous Peoples*	Risk that the programme is inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples due to lack in capacity or willingness to implement these rights caused by not involving experts or assigning responsibilities when designing and implementing the programme.	***Risk chance*** Very low probability as indigenous peoples are hardly present in the programme implementation area. ***Risk potential impact*** Medium seeing as the programme activities to a great extent cannot lead to adverse impacts for indigenous people. ***No further assessment*** The programme identifies indigenous people and involves them in the consultations and programme activities. Monitoring activities will be implemented to ensure rights are not violated.	N/a
8. *Involuntary Resettlement*	Risk that the programme leads to the need for involuntary resettlement due to loss of jobs or inaccessibility to homes caused by implementation of programme activities that have adverse impacts on livelihoods and access to homes.	***Risk chance*** Very low probability as the programme explicitly aims to prevent the need of resettlement by enhancing resilience to floods and drought. ***Risk potential impact*** Medium seeing as there are programmes in place to support people in resettling. ***No further assessment*** No need for a further assessment seeing as the chance of an issue is very low and there are already measures in place to manage issues should these occur. As part of the programme, modelling will be	N/a

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		conducted to analyse flood and drought events and their impact on communities.	
9. *Protection of Natural Habitats*	Risk that the programme involves unjustified conversion or degradation of critical natural habitats due to change in landscape caused by the implementation of programme activities such as flood barriers.	***Risk chance*** Very low probability as the programme explicitly aims to prevent damage caused by flood and drought events. ***Risk potential impact*** High seeing damage to natural habitats might be difficult to restore. ***No further assessment*** No need for a further assessment seeing as the chance of an issue is very low and the programme aims to realise the opposite by protecting natural habitats from floods and drought. The programme will identify natural habitats and monitor benefits or adverse impacts.	N/a
10. *Conservation of Biological Diversity*	Risk that the programme leads to significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species due to changes in the landscape or water management caused by the implementation of programme activities such as flood barriers.	***Risk chance*** Very low probability as the programme explicitly aims to prevent damage caused by flood and drought events therewith protecting biodiversity. ***Risk potential impact*** High seeing damage to natural habitats might be difficult to restore. ***No further assessment*** No need for a further assessment seeing as the chance of an issue is very low and	N/a

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		the programme aims to realise the opposite by protecting the biological diversity from floods and drought. The programme shall substantiate by identifying (1) biological diversity, (2) lack in potential of a significant or unjustified reduction or loss of biological diversity and (3) lack in potential to introduce known invasive species.	
11. Climate Change	Risk that the programme results in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change due to lack in climate considerations in programme activities (e.g. manufacturing of flood barriers) caused by lack in capacity or willingness to identify adverse impacts or implement mitigating measures.	N/a	***Risk chance*** Low seeing as the programme aims to implement tools and technologies that are driven by clean energy. ***Risk potential impact*** High seeing as an issue might exacerbate the negative impacts of climate change. ***Further assessment and management*** The programme shall identify activities and the possibility that these result in negative impacts on climate change. Specifically, the programme will explore manufacturing processes of technologies and define mitigation measures.
12. Pollution Prevention and Resource Efficiency	Risk that the programme does not meet international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants due to lack in capacity or willingness to identify	N/a	***Risk chance*** Low seeing as the programme aims to implement tools and technologies that are climate friendly. ***Risk potential impact***

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
	standards or implement mitigating measures caused by improper design of the programme assigning responsibilities on the subject matter.		High seeing as an issue might lead to excessive costs or pollution negatively impacting the environment or people. ***Further assessment and management*** The programme assesses and explains how it will minimize in a reasonable and cost-effective way the resources that will be used during implementation especially during the production process. The programme will do the same for prevention of waste and pollution.
13. Public Health	Risk that the programme leads to significant negative impacts on public health due to not adequately analyzing determinants of health or implementing mitigating measures caused by improper design of the programme or assigning responsibilities on the subject matter	***Risk chance*** Very low probability as the programme explicitly aims to improve public health by reducing vulnerabilities to flood and drought. ***Risk potential impact*** High seeing as the population could suffer injuries or health issues ***No further assessment*** No need for a further assessment seeing as the chance of an issue is very low and the programme aims to protect people from floods and drought. The programme shall complete a health impact checklist.	N/a
14. Physical and Cultural Heritage	Risk that the programme leads to the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values	***Risk chance*** Very low probability as there is hardly any presence of cultural heritage in or near the programme.	N/a

Environmental and social principles	Risks triggered by the programme	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
	recognized as such at the community, national or international level due to a lack of consideration caused by improper identification of physical and cultural heritage.	***Risk potential impact*** Medium seeing as the population could suffer injuries or health issues ***No further assessment*** No need for a further assessment seeing as the chance of an issue is very low and the potential impact us medium. The programme shall identify the presence of cultural heritage during consultations.	
15. Lands and Soil Conservation	Risk that the programme does not promote soil conservation and leads to degradation or conversion of productive lands or land that provides valuable ecosystem services due to changes in the landscape or water management caused by the implementation of programme activities such as flood barriers.	***Risk chance*** Very low probability as the programme explicitly aims to prevent degradation or conversion of productive lands that provides valuable ecosystem services. ***Risk potential impact*** High seeing degradation or conversion of productive lands or land could damage the ecosystem and livelihoods. ***No further assessment*** No need for a further assessment seeing as the chance of an issue is very low and the programme aims to realise the opposite by protecting productive lands or land. The programme shall identify the presence of fragile soils and productive land that provides valuable ecosystem services within the programme area.	N/a

Annex 3: Report Consultative Process

Consultative Process Report:
Programme Concept Note Burundi Flood and Drought Resilience.

Introduction:
In order to ensure that the programme to enhance resilience to flood and drought risk in the Imbo Basin is relevant and responsive to the needs of all stakeholders, a consultative process was conducted with a range of stakeholders in the programme area. This report documents the stakeholders consulted, the consultation techniques used, and the key consultation findings for the concept note.

Timeframe:
The consultative process started with the pilot project that was implemented in 2022. The consultations have taken place between 1 January 2022 and 1 December 2022.

Stakeholder Groups Consulted*:
The following stakeholders were consulted as part of the consultative process:

i. Local and regional government
ii. Technical experts
iii. Parliament
iv. Indigenous people
v. Environmental protection
vi. Local community
vii. Gender expert
viii. Agricultural sector
ix. Media
x. Research institutions

** The names of the representatives are included in Table J in Annex 2*

Consultation Techniques:
A range of consultation techniques were used to ensure that the views and opinions of all stakeholders were captured. These techniques included:

i. Online workshops with representatives of various stakeholder groups: Three workshops were conducted involving people from the local government, community members, technical experts, women's representatives, and technical experts. The workshops were moderated by a local NGO.
ii. Interviews with local stakeholders: 15 key informant interviews were conducted with local leaders and government officials, including community leaders, district administrators, indigenous people, researchers, and representatives from the local and regional government.
iii. Focus group discussions with farmers and pastoralists: two focus group discussions were conducted with farmers and communities in the programme area. The discussions were moderated by local facilitators who were trained to conduct focus group discussions.

Key Consultation Findings:
The key findings from the consultations are summarized below:

i. There are concerns with regards to the construction of the water harvesting infrastructure. The design of the water harvesting infrastructure will be aligned with the different stakeholders and the impact will be carefully evaluated as part of the Environmental and Social Impact Assessment (ESIA).
ii. Participants stressed that the positioning of the water-filled flood barrier must not damage other part of the community or neighboring communities. The programme shall use state-of-the-art hydrodynamic modeling software to analyse floods and how a flood barrier impacts other areas.
iii. Various participants expressed the risk of vandalism of the interventions such as the flood barrier and the solar powered cold storage unit. The programme design shall include measures to mitigate these risks to an acceptable level; these measures will be identified during a risk assessment workshop with the approval of all participants.
iv. There are concerns with regards to the extent to which different stakeholders at different levels of society shall collaborate after completion of the programme. This concern is addressed with Components 3 and 4. The programme will include specific targets related to collaboration in the M&E Framework.
v. There were multiple questions on the roles and responsibilities and ownership related to the implemented tools and technologies such as the flood barrier and the solar powered cold storage unit. The programme shall make detailed yet comprehensible roles and responsibility matrices. In addition, the programme will ensure that the interests of different stakeholders are taken into consideration to prevent individuals or groups from not benefitting of the adaptation measures.
vi. Farmers and pastoralists expressed a strong interest in the irrigation system and water-filled mobile flood barrier, as these technologies would help them to better manage flood and drought risks and improve their yields.
vii. Local leaders and government officials stressed the importance of involving communities in the programme design and implementation and ensuring that the programme benefits are equitably distributed across the project site(s).
viii. An NGO and private sector actors emphasized the need for capacity building and training for farmers and pastoralists, and the importance of sustainability and long-term maintenance of the programme interventions.
ix. Academic institutions and researchers provided feedback on the technical aspects of the programme design and highlighted the need for monitoring and evaluation to ensure that the programme is achieving its objectives.

Conclusion:
The consultative process was a valuable exercise in gathering feedback and input from a range of stakeholders and ensuring that the programme is relevant and responsive to the needs of the communities it serves. The findings from the consultations will be used in the next phases including programme design and implementation.

Next steps:
The programme shall conduct consultations during the next phases starting with the feasibility study. Online surveys shall be used in addition to the already applied consultative techniques. The next consultations include information gathering at a more granular level to ensure that the programme is relevant and responsive to the needs of all stakeholders. The consultations will be used to select the project sites and to co-design the interventions. The outcome of the feasibility study shall be incorporated in the programme design i.e. the full proposal.

Annex 4: List of Acronyms and Abbreviations

Acronym / Abbreviation	Definition
AB	Adaptation Benefit
ABM	Adaptation Benefits Mechanism
AF	Adaptation Fund
AfDB	African Development Bank
CBD	Convention on Biological Diversity
CCD	Convention to Combat Desertification
COP	Conference of the Parties
DEM	Digital Elevation Model
EDPM	Ethylene Propylene Diene Monomer
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
EWS	Early Warning System
FDMP	Flood and Drought Management Plan
FEWS	Flood Early Warning System
FEWS NET	Famine Early Warning Systems Network
FIS	Flood Intelligence Service
GCA	Global Center of Adaptation
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gases
GP	Gender Policy
IT	Information Technology
LiDAR	Light Detection and Ranging
M&E	Monitoring and Evaluation
NAPA	National Action Plan for Adaptation
NBS	Nature Based Solution
ND-GAIN	Notre Dame Global Adaptation Initiative
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organisation
O&M	Operation and Maintenance
OECD	Organization for Economic Cooperation and Development
P.ACT	Partnership Co-Design Toolkit
SDG	Sustainable Development Goal
SRF	Strategic Results Framework

SRIF	Safeguard Risk Identification Form
TAHMO	Trans-African Hydro-Meteorological Observatory
TAP	Technology Action Plan
TNA	Technology Needs Assessment
ToC	Theory of Change
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollar
USP	Unidentified Sub-Projects