

AFB/PPRC.31/49 27 February 2023

Adaptation Fund Board Project and Programme Review Committee Thirty first Meeting Bonn, Germany 21-22 March, 2023

Agenda Item 9 e)

PROPOSAL FOR LARGE INNOVATION PROJECT FOR BURUNDI

Background

1. At its thirtieth meeting, having considered document AFB/B.30/5/Rev.1, the Adaptation Fund Board (the Board) decided:

- (a) To adopt the medium-term strategy as amended by the Board, as contained in the Annex 1 of the document AFB/B.30/5/Rev.1 (the MTS); and
- (b) To request the secretariat:
 - (i) To broadly disseminate the MTS and work with key stakeholders to build understanding and support;
 - (ii) To prepare, under the supervision of the MTS task force, a draft implementation plan for operationalizing the MTS, containing a draft budget and addressing key assumptions and risks, including but not limited to funding and political risks, for consideration by the Board at its thirty-first meeting; and
 - (iii) To draft, as part of the implementation plan, the updates/modifications to the operational policies and guidelines of the Adaptation Fund needed to facilitate implementation of the MTS, for consideration by the Board at its thirty-first meeting.

(Decision B.30/42)

2. Pursuant to decision B.30/42, subparagraph (b) (ii), the secretariat prepared a draft implementation plan for the MTS, including an assessment of assumptions and risks. The secretariat shared a version of the draft with the MTS task force for comments.

3. The draft implementation plan also contains suggestions for specific funding windows that might be opened under the MTS in complement of the Fund's existing funding windows for singlecountry and regional adaptation projects and readiness support projects. Following the approval of the implementation plan, the secretariat would present specific proposed details for each new funding window at subsequent meetings of the Board for its consideration, in accordance with the timeline contained in the implementation plan.

4. At its thirty-first meeting, the Board discussed the draft implementation plan for the MTS, and members of the Board proposed amendments to the document. The secretariat then presented a revised draft, in document AFB/B.31/5/Rev.1. Having considered that document, the Board decided:

- (a) To approve the implementation plan for the medium-term strategy for the Fund for 2018– 2022 contained in the Annex I to document AFB/B.31/5/Rev.1 (the plan);
- (b) To request the secretariat:

[...]

- (iii) To prepare, for each proposed new type of grant and funding window, a specific document containing objectives, review criteria, expected grant sizes, implementation modalities, review process and other relevant features and submit it to the Board for its consideration in accordance with the tentative timeline contained in Annex I to document AFB/B.31/5/Rev.1, with input from the Board's committees;
- (iv) Following consideration of the new types of support mentioned in subparagraph (b)(iii), to propose, as necessary, amendments to the Fund's operational policies and guidelines Fund to better facilitate the implementation of such new types of support; and

[...]

(Decision B.31/32)

5. At the second session of its thirty-fifth meeting, the Board considered document AFB/PPRC.26.b/16, Program on Innovation: Large Grants for Innovation, and the Board decided:

(a) To approve the process for providing funding for innovation through large grants to Implementing Entities (IEs) as described in document AFB/PPRC.26.b/16; including the proposed objectives, review criteria, expected grant sizes, implementation modalities, review process and other relevant features as described in the document;

(b) That the large grants for innovation would fall outside the country cap approved by the Board in decision B.13/23 or, in the case of regional or multi-regional proposals, the regional provision, whereas they would count against the Multilateral Implementing Entity cap as per decision B.12/9;

(c) To request the secretariat to prepare the first Request for Proposals to IEs for a total amount of US \$30 million to be launched by the first quarter of calendar year of 2021; and

(d) To request the secretariat to consider the need to develop specific objectives and indicators for the innovation aspects of the projects, beyond what is included in the regular project performance reporting process and make relevant recommendations to the Board at its thirty-seventh meeting.

(Decision B.35.b/8)

6. At its thirty-sixth meeting, the Board considered the document AFB/PPRC.27/28, *Programme on Innovation: Operationalization of Large Grants for Innovation*, and the Board decided:

(a) To approve the Innovation Large Grant Project Proposal template, the Review Criteria template and the Instructions for Preparing a Proposal for Innovation Large Grants, as described in annexes II, III and IV to document AFB/PPRC.27/28;

(b) To launch the request for proposals so that submissions of Innovation Large Grants proposals are invited to be considered as early as the thirty-seventh meeting of the Board.

(Decision B.36/24)

7. Subsequently, the first call for project and programme proposals under the indicative set-aside amount of US\$ 30 million was issued to eligible Parties to submit large innovation project and programme proposals to the Fund through accredited NIEs, RIEs and MIEs.

- 8. The following concept note document titled "Enhancing resilience to flood and drought through a unique combination of innovative climate adaptation tools, technologies, and practices in Burundi" was submitted for Burundi by United Nations Environment Programme (UNEP), which is a Multilateral Implementing Entity of the Adaptation Fund.
- 9. This is the first submission of the proposal, using the two-step submission process.

10. The current submission was received by the secretariat in time to be considered in the fortieth Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the Project ID number AF00000343, and completed a review sheet.

11. In accordance with a request to the secretariat made by the Board in its 10th meeting, the secretariat shared this review sheet with UNEP and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

12. The secretariat is submitting to the PPRC the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. In accordance with decision B.25/15, the proposal is submitted with changes between the initial submission and the revised version highlighted or with track changes.



ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: SINGLE LARGE INNOVATION PROJECTS

Country/Region:	Burundi		
Project Title:	Enhancing resilience to flood and drought through a unique combination of innovative climate adaptation tools, technologies, and practices in Burundi		
Thematic Focal Area:	Disaster risk reduction	n and Food security	
Implementing Entity:	United Nations Environment Programme (UNEP)		
Executing Entities:	Ministère de l'Environnement, de l'Agriculture et de l'Elevage		
AF Project ID:	AF00000343		
IE Project ID:	[To be filled by IE] Requested Financing from Adaptation Fund (US Dollars): 5,001,480		
Reviewer and contact pe IE Contact Person:		Co-reviewer(s): Alysa Gomes	

Technical Summary	The project "Enhancing resilience to flood and drought through a unique combination of innovative climate adaptation tools, technologies, and practices in Burundi" aims to increase the resilience of people and institutions in Burundi to flood and drought events. This will be done through the four components below:
	<u>Component 1</u> : Development and enhancement of flood and drought information technology and services (USD 470,000);
	<u>Component 2:</u> Implementing innovative flood and drought adaptation tools, technologies, and practices (USD 3,220,000);
	<u>Component 3</u> : Strengthening the capacity of stakeholders to manage (climate change-induced) flood and drought risks. (USD 310,000);
	<u>Component 4</u> : Enhancing knowledge management, awareness creation and information sharing on flood and drought risks. (USD 210,000).
	Requested financing overview:

	Project/Programme Execution Cost: USD 421,000 Total Project/Programme Cost: USD 4,631,000 Implementing Fee: USD 370,480
	Financing Requested: USD 5,001,480 The first technical review finds that the proposal needs to further clarify a number of issues such as the lesson- learned from the previous pilot projects, specify the target beneficiaries, the Theory of Change, coherence among the four components, sustainability, and Environmental and Social Policy and Gender Policy Compliance, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Requests (CARs) raised in the review.
Date:	10 February 2023

Review Criteria	Questions	Comments First Technical Review
	 Is/are the beneficiary country/countries a developing country/countries Party/Parties to the Kyoto Protocol? 	Yes
	2. Is the participating country / are all participating countries developing countries particularly	Yes (Pages 5 -9).
Country Eligibility	vulnerable to the adverse effects of climate change?	Burundi is vulnerable to the adverse effects of climate change (i.e., ranks 165 out of 180 countries in the 2022 ND-GAIN index). The program sites: Imbo Basin area across the four provinces (Cibitoke, Bubanza and Bujumbura Rural and Bujumbura Mairie) are vulnerable to flooding and drought (p.8-9)
	 Has the designated government authority for the Adaptation Fund / Have the governments' designated authorities for 	Yes. As per the Endorsement letter dated 28 th November
	the Adaptation Fund endorsed the project?	2022.
Project Eligibility	2. Does the project/programme support concrete adaptation actions to assist the country or countries in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	Not cleared. The project aims to scale up a successful pilot project and at the same time expand not only the regional

	In case of regional project/programme, is there added value using the regional approach, compared to implementing similar activities in each country individually?	 scope but also, the scope of the adaptation measures to mitigate flood and drought risks. (p.9). The proposal also briefly mentions that the current project aims to build on the knowledge, experience, and lessons of the pilot project. The information provided on page 10 is not sufficient to clarify what were the lessons learned from the pilot project and how the current project builds on and adapts based on the lessons generated. CR1: In the project justification please provide additional details on the learning (challenges and best practice) from the pilot project from the point of view of the intervention itself (SLAMDAM), stakeholder engagement, sustainability, and scaling potential and how the current project has integrated that learning into the design of the existing project. The project aims to enhance resilience to flood and drought through a combination of tools, information technologies, and practices. However, the proposal seems to be based on the following assumptions: SLAMDAM can provide multiple benefits and will play a central role in the project ecosystem (flood and drought prevention and support livelihood activities) Farmers/people will use the repurposed irrigation system (i.e., use the flood-filled barrier for irrigation during dry season) if they can gain access to water. Cold storages will change the agriculture value chain.
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(cash crops for export or staple crops for communities' consumption).CR3: Please clarify what are the market needs based on the agricultural value chain analysis (if this is done) and then explain how the solar powered cold storages are envisioned to address the challenge.CR4: Please clarify who manage the information technology such as LiDAR, its system and services to enhance the drought and flood management. Please also provide the detailed capacity building plan to use the information technology.The role that insurance and insurance providers are expected to play in the ecosystem is not entire clear. CR5: Please clarify the role of insurance providers and how does index-based insurance fit within the theory of change of the project. Related to this, please clarify if there are known players in the country/ target region or insurance provider will be identified at a later stage.3. Does the project/programme help spread innovative adaptation practices, tools and technologies that have demonstrated success in one country to another country, countries orNot Cleared. The proposal aims to develop an innovation ecosystem that involves various players (private		The above assumptions are not sufficiently substantiated with a concise problem statement. For example: What is the current situation; What are the productive sectors in the target areas that are impacted by climate impacts and What are the gaps in the agricultural value chain that the project aims to address. CR2: Please clarify the crop type the farmers produce (asp. areas for expect or staple areas for communities'
and then explain how the solar powered cold storages are envisioned to address the challenge. CR4: Please clarify who manage the information technology such as LiDAR, its system and services to enhance the drought and flood management. Please also provide the detailed capacity building plan to use the information technology. The role that insurance and insurance providers are expected to play in the ecosystem is not entire clear. CR5: Please clarify the role of insurance providers and how does index-based insurance fit within the theory of change of the project. Related to this, please clarify if there are known players in the country/ target region or insurance provider will be identified at a later stage. 3. Does the project/programme help spread innovative adaptation practices, tools and technologies that have demonstrated success in one country to another country, countries or Not Cleared. The proposal aims to develop an innovation ecosystem that involves various players (private		consumption).
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spread innovative adaptation practices, tools and technologies that have demonstrated success in one country to another country, countries or	3 Does the project/programme help	
one country to another country, countries or ecosystem that involves various players (private	spread innovative adaptation practices, tools and	
regions: and/or		

Does the project/programme pilot at larger scale innovative adaptation practices, tools or technologies generated that have demonstrated viability at a small scale?	partners and technology providers etc.), stakeholders from the government at various levels, and community members. This is innovative and is in line with the fund's definition for innovation.
	The proposal aims to build this ecosystem in the target area - Imbo Basin through a combination of tools (such as water-filled mobile barriers, index- based insurance, irrigation system, solar powered cold storage), information technologies, and practices. However, the proposal does not develop well the linkages among these components and has not sufficiently clarified the possible sequencing of events or potential scenarios under which the interventions will be deployed.
	CR6: Please clarify the theory change and clarify how the components are activities are linked.
	A pilot project was implemented at the Mpanda Commune in the Bubanza Province in 2022. The pilot project demonstrated the successful deployment of the water-filled mobile flood barrier; however, it does not include the changes in the climate adaptation practices of people/groups who received such climate smart agricultural extension services.
	CR7: Please provide insights / lesson-learned from the pilot project specifically related to how the interventions altered the practices/behaviors of beneficiaries on the ground. Please also include the challenges and how these are addressed in the proposal.
	CR8: Please provide the detailed capacity building

			for farmers and others to use the SLAMDAM tion systems.
4.	Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Not of The enotic on the and s below 1. 2. 3. 4.	cleared. economic, environmental, and social benefits are lear because information has not been provided e existing social structures, economic activities sectors and the basin ecosystem.
5.	Does the project engage, empower and/or benefit the most vulnerable communities and social groups?	The p be er	cleared. proposal states that vulnerable communities will ngaged in the project activities; however, the psal is not developed in terms of strategies to

		 encourage and involve all social groups into the implementation of the project. CAR1: Please provide information on 1) the socio-demographic overview, including community governance structures of the vulnerable communities and social groups, and 2) the strategies to encourage and involve all communities and groups into the implementation of the project to avoid running the risk of social exclusion.
6.	Does the project advance gender equality and the empowerment of women and girls?	Not cleared. CAR2: Please provide the findings of an initial gender analysis / assessment to determine the different needs, capabilities, roles and knowledge resources of women and men.
7.	Is the project/programme cost-effective? In the case of regional project/ programmes, does the regional approach support cost effectiveness? Does the project engage, empower and/or benefit the most vulnerable communities and social groups?	Not cleared. CR10: The proposal states that "the cost-effectiveness will be measured and monitoredusing predefined indicators expressed monetary and non-monetary values" (p.33). Please clarify the indicators of above. Cost effectiveness should be also demonstrated from a sustainability point of view. CR11: Please list up all expected cost items to operate for the long-term, including but not limited to the repair and maintenance fees for the water-filled mobile flood barrier, solar panels and charge controllers, the labour cost to operate the solar powered cold storage facilities, etc, and make clear the responsibility to cover such cost. CR12 Please clarify the property rights of the tools, devices, technology, and technology information systems that will be installed in the communities.

8. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	Cleared. The proposal identifies the relevant plans and strategies with related to National Action Plan for Adaptation, Nationally Determined Contributions, National Strategy and Action Plan, and Technology Needs Assessment (p.34 – 36).
9. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Not cleared. The proposal explains the relevant national technical standards (Table C and D). CAR3: Please fill up with some blanks in the Annex, for example where spaces are left with the following: [Insert Authority] and [Explain How] in the row of "project relevance and compliance" in table C.
10. Is there duplication of project / programme with other funding sources?	Not cleared. The proposal outlines the duplications and alignment with eight other project/programs related to flood and drought risk management in Burundi (Table E). However, it the proposal would benefit from clarifying other projects/programs beyond flood and drought risk management because the program designs involve the combination of tools, technologies, and practices in the agriculture value-chain.
	CR13: One of the expected economic benefits is "improved value chain related to crops and livestock products to increase economic value" (economic benefits of Outcome 3.2). Please include the information on the infrastructure development projects/programs such as related to the lake transportation and the ports development in Lake Tanganyika if the proposal expects to increase the export of crops.

11. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	 Not cleared. The proposal includes knowledge management activities and dissemination of lessons learned as one of the four components of the project. However, the project does not include details of specific activities. CR14: Please include detailed information on the activities and identify who will be involved in each activity. Please ensure include all project beneficiaries.
12. Has a consultative process taken place, and has it	 CAR4: Please clarify feedback - learning - development cycles in the project to improve the innovation process. Please specify how this is an embedded mechanism that goes beyond simple disseminating results or collecting learning. Not cleared.
involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	CAR5: Please include sufficient details on the points below.
	 Stakeholders involved in the initial consultation process with attention to minority groups, gender, marginalized and vulnerable groups in the project/program target areas. The results of the consultative process and how they are reflected in the project design. A brief report documenting the consultative process and contains a) the list of stakeholders already consulted (principles of choice, role ascription, date of consultation) see the page on 9 of the Instruction Guide: <u>Submission Instruction</u> <u>Guide</u>, b) a description of the consultation techniques (tailored specifically per target group), c) the key consultation findings (suggestions and concerns raised). <u>If detailed consultations are</u>

	expected to be done at a later stage (during fully developed proposal development stage), please explain the process with consideration of the elements in bullet point 3).
13. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Cleared. The proposal states that "the programme described in this proposal remains a stand-alone programme that can realise its objectives without co-financing" The proposal further explains that co-financing should be received from 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 realize its objectives without co- financing". (p.43)
14. Is the project / program aligned with AF's results framework?	CAR6: Please clarify alignment with the AF Strategic Results Framework in the description of the project components. An alignment table is not needed at the concept note stage, but the alignment with outcomes of the SRF should be described in a sentence or two to whichever component they might apply. <u>https://www.adaptation-fund.org/wp-</u> <u>content/uploads/2022/03/AFB.PPRC_29.44-</u> <u>Guidance-to-IEs-for-inclusion-of-objectives-and-</u> <u>Indicators-for-Innovation.pdf</u>
15. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	 Not cleared. CAR7: Please explain sustainability with consideration of the following points: 1. How to ensure sustainability of the irrigation system in the long term but also how to foster behavioural change from the existing practices

	 employed by farmers and pastoralists to continue using sustainable methods in the long-term 2. Who and how the solar powered cold storage facilities will be managed, operated and maintained in the long-term? 3. Who will take responsibility to maintain any infrastructure or installations for the long-term 4. Please clarify whether the vision ultimately involves self-financing of the product and service or will require sustained budgetary funding for viability
16. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Not cleared. The proposal has not identified the exact locations of the implementation yet. The proposal states that the program is classified as Category C (p.46). The risk identification presented on Table 6. The proposal contains various element that could be clarified as Unidentified Sub-Projects (USPs) such as the target intervention sites, beneficiaries/specified target groups, the users of the irrigation system, the information system, sites for the solar powered cold storage facility etc. CR15: Please clarify when the project sites will be identified (e.g., at fully developed proposal stage or during implementation). If the project sites are to be
	identified during implementation). In the project sites are to be includes USPs and this should be stated in the description of section II.L At fully developed proposal stage, adequate provisions should be included to ensure that UPSs will also be compliant with the ESP.

Resource Availability	 Is the requested project funding within the parameters for large grants set by the Board? 	 No. The proposed funding is US\$ 5,001,380 that is above the large innovation project grants: US\$ 5 million. CAR8: Please revise the project total so that it does not exceed \$5 million. In doing so, please ensure the consistency of financial figures throughout the proposal.
	 2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project budget before the fee? Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)? For regional projects/programmes, are the administrative costs (Implementing Entity Management Fee and Project/ Programme Execution Costs) at or below 10 per cent of the project/programme for implementing entity (IE) fees and at or below 10 per cent of the project/programme cost for the execution costs? 	Not clearedCAR9: In the components and financing table, the EEfee is mentioned at 10%. Please revise to be incompliance with the fund's requirements.Single country project's IE fees are capped at 8.5% andEE costs are capped at 9.5%
Eligibility of IE	 Is the project submitted through an Implementing Entity accredited by the Board? 	Yes.
Implementation Arrangements	 Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund? Proponents are encouraged to refer to the Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, for details. 	NA at concept note stage.
	2. Are there measures for financial and project/programme risk management?	NA at concept note stage.

3. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	NA at concept note stage.
 Is a budget on the Implementing Entity Management Fee use included? 	NA at concept note stage.
Is an explanation and breakdown of the execution cost included?	NA at concept note stage.
6. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	NA at concept note stage.
Is the timeframe for the proposed activities adequate?	NA at concept note stage.
8. Is a summary breakdown of the budget for the proposed activities included?	NA at concept note stage.
9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	NA at concept note stage.
10. Is a disbursement schedule with time-bound milestones included?	NA at concept note stage.



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:	Ministère de l'Environnement, de l'Agriculture et de
	l'Elevage
Amount of Financing Requested:	5,001,480 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}.
- 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 GDP, occupying almost 94% of the working population⁴. Agriculture exports (coffee, tea, cotton) provide all but a small percentage of export revenues⁵.
- 3. 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 families⁶.
- 4. Burundi's annual population growth, 3.1%⁷, is among the highest in the world. The country's population is projected to more than double by 2050. With an average density of more than 400 people per square kilometre, Burundi is the second most densely populated country in Sub-Saharan Africa. Population densities vary across the country⁸. 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 south⁹.
- 5. Ranking in the bottom five countries of the Human Development Index, poverty is widespread, with 90-95% of the population living on less than 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 food¹⁰. 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 provinces¹¹.

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)

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

⁸ Burundi Ministry of Finance, 2007 in Baramburiye et al. (2013)

⁹ Baramburiye et al. (2013)

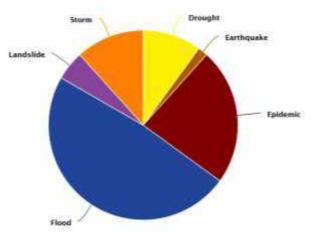
¹⁰ World Population Review – Burundi. http://worldpopulationreview.com/countries/burundi-population/

¹¹ 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).

6. 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 capacities¹² 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 UNFCCC conferences and agreements.

1.2 Impact Climate Change

- 7. Globally, Burundi has the lowest per capita 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 ND-GAIN index¹³ (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.
- 8. 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.



Natural Hazard Occurrence for 1980 – 2020

Figure 1: Average Annual Natural Hazard Occurrence for 1980 – 2020¹⁴

¹² 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

¹³ 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/

¹⁴ https://climateknowledgeportal.worldbank.org/country/burundi/vulnerability

- 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 FEWS NET and USAID (2009): Livelihoods zoning "plus" activity in Burundi):
 - BI01 (Buragane): droughts and erosion¹⁵;
 - 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

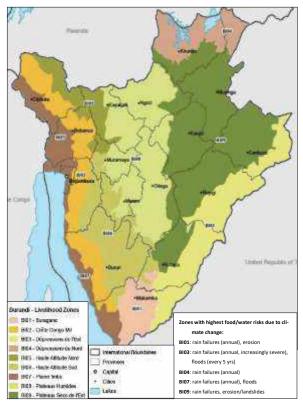


Figure 2: Zones most at risk due to climate change

- 10. Projections for future changes in temperature due to climate change estimate an increase of 0.4°C per decade¹⁶ and a 1.9°C increase by 2050¹⁷. Projections suggest the following¹⁸:
 - 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.
 - Droughts are expected to become more intense and more frequent, occurring between 40 and 60% of the time.

¹⁵ FEWS NET and USAID (2009)

¹⁶ Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

¹⁷ Climate Change Knowledge Portal. Available via: http://sdwebx. worldbank.org/climateportal/countryprofile/home. cfm?page=country_profile&CCode=BDI&ThisTab=ClimateFuture

¹⁸ World Bank Climate Change Knowledge Portal, Burundi. http://sdwebx.worldbank.org/climateportal/countryprofile/home. cfm?page=country_profile&CCode=BDI

11. 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 decades¹⁹. 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 earnings²⁰. Extreme floods and droughts are estimated to result in a reduction of long-term growth by 2.4% of GDP per year²¹.

1.3 Programme Area

- 12. The programme will be implemented at one or multiple sites within the Imbo Basin across 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.
 - 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

¹⁹ Baramburiye et al. (2013)

²⁰ 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

²¹ DFID (2011): The economic impacts of climate change in Burundi. http://weadapt.org/knowledge-base/economics-of-adaptation/ economics-of-adaptation-burundi

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.

13. The programme area is rather broad at this stage. The programme shall identify the exact location(s) of the implementation and include this in the full proposal. Insight in the exact locations ensures that the programme can adhere to the Environmental and Social Policy (ESP) and the Gender Policy (GP) of the Adaptation Fund. The aim is to analyse environmental and social risks for each programme activity and avoid any unidentified sub-projects (USPs)²² when submitting the full proposal.

1.4 Upscaling Pilot Project

14. 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 COP27 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

²² 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

unique portfolio of innovative solutions has been designed centred around the water-filled mobile flood barrier.

- 15. 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 NGO. Lessons learned from the pilot project shall be taken into consideration with the proposed programme. The key lessons learned are:
 - (i) The country lacks in a data rich environment with reliable weather-related to support flood and drought risk analyses. The proposed programme therefore must enrich available data.
 - (ii) 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.
 - (iii) One of the most important reasons that the pilot project was successful, was due to the collaboration with a highly professional local partner. The same partner shall be involved in the proposed programme.
- 16. The pilot project was implemented at the Mpanda Commune which lies in the Bubanza Province. The members involved in the programme are therefore already familiar with flood and drought risks at a site within the Imbo Basin.

2. Programme Objectives

- 17. 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.
- 18. 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. Development and enhancement of flood and drought information technology and	1.1: Increased usage of effective information technology by	1.1.1: Efficient and effective flood and drought information technology and services implemented.	Burundi	250,000
services.	stakeholders.	1.1.2: Collected and stored data to support flood and drought information services.	Burundi	100,000
		1.1.3: Institutional linkages for information established.	Burundi	40,000
		1.1.4: Feedback mechanism for information services developed.	Burundi	40,000
		1.1.5: Emergency plan for flood and drought management is put in place.	Burundi	40,000
2. Implementing innovative flood and drought adaptation tools, technologies, and	2.1: Increased uptake and usage of innovative flood adaptation tools,	2.1.1: Flood risks analysed, and flood adaptation tools, technologies and practices designed.	Burundi	130,000
practices.	technologies and practices.	2.1.2: Enabling environment for flood adaptation tools, technologies and practices created.	Burundi	80,000
		2.1.3: Innovative water-filled mobile flood prevention structures constructed.	Burundi	1,650,000
		2.1.4: Adaptive flood prevention practices promoted.	Burundi	50,000
	2.2: Increased uptake and usage of innovative drought	2.2.1: Drought risks analysed, and drought adaptation tools, technologies and practices designed.	Burundi	100,000
	adaptation tools, technologies and practices.	2.2.2: Enabling environment for drought adaptation tools, technologies and practices created.	Burundi	50,000
		2.2.3: Innovative water harnessing and irrigation structures established.	Burundi	1,100,000
		2.2.4: Adaptive drought prevention practices promoted.	Burundi	60,000

3. Strengthening the capacity of stakeholders to manage (climate change-induced) flood and drought risks.	3.1: Flood and drought resilience of key stakeholders at national and sub- national level	 3.1.1: Flood and drought management plans (FDMPs) integrating climate change aspects and adaptation actions are developed. 3.1.2: Adaptive capacity of 	Burundi Burundi	100,000
	strengthened.	institutions, farmers, and pastoralists in flood and drought management is improved.	Burunui	110,000
	3.2: Partnerships for flood and drought management at national and sub- national level strengthened.	3.2.1: New/existing national and sub-national arrangements/networks for flood and drought management supported.	Burundi	100,000
4. Enhancing knowledge management, awareness creation and	4.1: Strengthened awareness and ownership of flood and drought	4.1.1: Good practices and lessons on flood and drought management documented and disseminated.	Burundi	110,000
information sharing on flood and drought risks.	adaptation and climate risk reduction processes at local level.	4.1.2: Flood and drought information management strengthened.	Burundi	100,000
6. Programme Execution cost (10%)				421,000
7. Total Programme Cost				4,631,000
8. Programme Cycle Management Fee charged by the Implementing Entity (7%) + UN SC RC (1%)				370,480
Amount of Financing Requested				5,001,480

4. Projected Calendar

Table 2: Programme calendar

Milestones	Expected Dates
Start of Programme Implementation	January 2024
Mid-term Review (if planned)	June 2025
Programme Closing	January 2027
Terminal Evaluation	June 2027

PART II: PROGRAMME JUSTIFICATION

A. Programme Components

COMPONENT

Development and enhancement of flood and drought information technology and services.

- 19. 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.
- 20. 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.
- 21. 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, 1.1.3, 1.1.4, 1.1.5, 1.2.1 and 1.2.2.

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

- 22. 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 an Early Warning System (EWS) and a Flood Intelligence Service (FIS). 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.
- 23. 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 selected supplier(s) with whom there will be service agreements. Capacity building and training

sessions will be organised to ensure stakeholders can operate and maintain information technology and benefit the most from information services.

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

- 24. There are many areas within the Imbo Basin where people are impacted by flood and drought risks 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.
- 25. 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 flood and drought information services such as an EWS (see Figure 4). This access to information allows stakeholders to effectively plan and respond to flood and drought events.



Figure 4: Early warning system will be implemented

Activities

- Activity 1.1.1.1: Perform gap analyses between current status of flood and drought information technology (soft- and hardware) with the desired information technology on national level and the target regions.
- Activity 1.1.1.2: Develop implementation plans to construct/upgrade the flood and drought information technology.
- Activity 1.1.1.3: Develop/upgrade flood and drought information technology at national and regional levels.
- Activity 1.1.1.4: Setup/renovate flood and drought resilience centers including data warehousing.

- Activity 1.1.1.5: Support/equip project beneficiaries to access flood and drought information (e.g. apps, brochure, SMS, radio etc.).

Output 1.1.2: Collected and stored data to support flood and drought information services.

26. 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 existing available 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.

Activities

- Activity 1.1.2.1: Assess the availability of data to support flood and drought information services including FIS and EWS.
- Activity 1.1.2.2: Collect/enrich data to support flood and drought information services.
- Activity 1.1.2.3: Store data to support flood and drought information services and setup user access management.
- Activity 1.1.2.4: Conduct baseline study.

Output 1.1.3: Institutional linkages for information established.

27. 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. The proposed programme follows a participatory approach when developing information technology and develops frameworks that clearly reflect processes including the different roles and responsibilities. Gatherings will be organised to create a paradigm shift to ensure information management is embedded in business-as-usual activities.

Activities

- Activity 1.1.3.1: Develop/review flood and drought information sharing frameworks at regional at national regional and local levels.
- Activity 1.1.3.2: Develop an implementation action plan to operationalize the frameworks.
- Activity 1.1.3.3: Hold meetings with institutions and other stakeholder groups for data sharing.
- Activity 1.1.3.4: Support national, regional, and local information sharing forums (including farmers and pastoralist associations).
- Activity 1.1.3.5: Support Incorporation of flood and drought information into planning and budgeting processes of Burundi.

Output 1.1.4: Feedback mechanism for information services developed.

28. 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.

Activities

- Activity 1.1.4.1: Support regular stakeholder flood and drought information feedback platforms for stakeholders such as farmers and pastoralists.
- Activity 1.1.4.2: Hold quarterly stakeholder meetings on flood and drought information utilization for national, regional, and local stakeholders.
- Activity 1.1.4.3: Conduct Knowledge, Attitude and Practices (KAP) surveys on flood and drought information.
- Activity 1.1.4.4: Develop periodic feedback user-friendly tools on accessing, utilizing, and reporting flood and drought information to mandated institutions.

Output 1.1.5: Emergency plan for flood and drought management is put in place.

29. Disseminating reliable flood and drought information enables effective preventive and repressive measures to reduce the risk of flood and drought damages. The information technology is therefore a trigger for follow-up actions such as the deployment of a mobile flood barrier. These follow-up actions are included in emergency plans including roles and responsibilities and process descriptions. Tools and materials can be provided to improve the dissemination of flood and drought threats such a flags or speakers.

Activities

- Activity 1.1.5.1: Develop an emergency response plan for flood and drought disasters at the national, regional, and local levels.
- Activity 1.1.5.2: Monitor the flood and drought information services, feedback mechanism and its contingency plan at regional/local level.
- Activity 1.1.5.3: Acquire tools and materials to disseminate warning messages to the populations (e.g., beacons, flags, sirens, signalling, speakers, telephone, local radios etc.).



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

30. 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.

31. 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. The aim is for the unique portfolio of adaptation measures to be a blueprint for future programmes to enhance resilience to flood and drought.



Figure 5: Flood and drought risks will be analyzed to design technologies

32. The activities for this component are highlighted below under outcomes 2.1 and 2.2 and outputs 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.2.1, 2.2.2, 2.2.3 and 2.2.4.

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

33. 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, a technology that has been demonstrated successfully in Burundi in 2022 as part of a pilot project. 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 risks analysed, and flood adaptation tools, technologies and practices designed.

34. 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 on how to deploy the mobile flood barrier to redirect excess flood water to innovative water harvesting and storage infrastructure.
- Activity 2.1.1.4: 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.

Output 2.1.2: Enabling environment for flood adaptation tools, technologies and practices created.

35. The environment must be suitable to implement flood adaptation tools and technologies such as the water-filled flood barrier. The areas at the selected sites must be such that the flood barrier can effectively be deployed. For example, the ground might need to be levelled or debris has to be removed to be able to deploy the flood barrier. Furthermore, the proposed programme shall assess how flood resilient measures impact/benefit stakeholders such as insurance companies and buyers of crops and livestock products. These stakeholders can support in the design and implementation the flood resilient measures.

Activities

- Activity 2.1.2.1: 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 2.1.2.2: Introduce and promote the mobile flood barrier to insurance companies and explore insurance products to address residual losses to climate risks. This technology will be useful to connect the potential beneficiaries to providers of the risk insurance solutions.
- Activity 2.1.2.3: Conduct flood risk assessments on the agriculture value chain.

Output 2.1.3: Innovative water-filled mobile flood prevention structures constructed.

36. 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. These analyses will be used to determine the dimensions of the flood barrier. 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).



Figure 6: Innovative mobile flood barrier will be implemented

Activities

- Activity 2.1.3.1: Construct appropriate, innovative mobile flood barriers and supporting equipment such as (solar powered) pumps and hoses.
- Activity 2.1.3.2: Construct storage facilities to store the mobile flood barrier.
- Activity 2.1.3.3: Ensure availability of appropriate means of transportation from the storage facility to the location of deployment such as trolleys or cars.
- Activity 2.1.3.4: 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.

Output 2.1.4: Adaptive flood prevention practices promoted.

37. The flood resilient technologies are implemented in combination with flood resilient practices. The combination of effective technologies with practices enables effective mitigation of flood risks. Flood adaptation practices include selecting the right type of crops and land for food production. Practices also pertain to taking the necessary actions to prevent damages caused by flooding e.g. by seeking shelter in case of a threat of flooding.

Activities

- Activity 2.1.4.1: Support selection and introduction of crops that are least impacted by floods.
- Activity 2.1.4.2: Promote land use changes to limit the impact of floods.
- Activity 2.1.4.3: Support selection of geographical area to grow crops or for livestock production to limit the impact of floods.
- Activity 2.1.4.4: Promote response practices in case of a flood warning (e.g. seeking shelter, protecting people and assets, recovery planning).

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

38. Concrete drought resilient tools, technologies and practices will be implemented at the selected locations to mitigate the risk of drought. The portfolio of measures centre around an innovative water-filled mobile flood barrier. The same technology that is used to mitigate flood risk will 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 risks analysed, and drought adaptation tools, technologies and practices designed.

39. 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: Undertake assessment on water utilization/potential/availability and develop water management plans in project sites.
- Activity 2.2.1.4: Design drought adaptation measures and technologies including water harvesting facility (e.g. man-made lake or water tower), water treatment system, irrigation system.

Output 2.2.2: Enabling environment for drought adaptation tools, technologies and practices created.

40. The environment must be suitable to implement drought adaptation tools and technologies such as a water harvesting infrastructure. The areas at the selected sites must be such that the drought resilient measures can effectively be deployed. Furthermore, the proposed programme shall assess how drought resilient measures impact/benefit stakeholders such as farmers and buyers of crops and livestock products. These stakeholders can support in the design and implementation the drought resilient measures.

Activities

- Activity 2.2.2.1: Introduce and explore (Index-based) weather insurance in partnership with insurance companies. The project will mobilize partners to support Burundi to enhance knowledge and capacity on innovative risk insurance.

- Activity 2.2.2.2: Facilitate farmer and pastoralists associations/cooperatives and other stakeholder groups to generate analyze and share market information.
- Activity 2.2.2.3: Conduct drought risk assessments on the agriculture value chain.
- Activity 2.2.2.4: Create linkages between farmer and pastoralists associations/cooperatives at regional, national and sub-national levels to enable sharing of market information.

Output 2.2.3: Innovative water harnessing, and irrigation structures established.

41. 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 7: Water-filled flood barrier will serve as a water harvesting infrastructure

42. 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 8: A solar pumping and irrigation system

Activities

- Activity 2.2.3.1: Construct appropriate, innovative water harvesting and storage infrastructure (e.g. man-made lake with EPDM layer, water tower, EPDM storage units. Measures/technologies will also be implemented to prevent evaporation of water when it's stored.
- Activity 2.2.3.2: Construct irrigation and water delivery systems (e.g. gravity flow scheme, micro-irrigation systems, check dams, drip irrigation, borehole 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 2.2.3.3: 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 2.2.3.4: Promote appropriate water and soil conversation measures (e.g. minimal water usage for crops production, soil fertility management.
- Activity 2.2.3.5: Construct a solar power powered cold storage to store crops for a longer period to enhance food security during dry season.

Output 2.2.4: Adaptive drought prevention practices promoted.

43. 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 (see Figure 9). 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.



Figure 9: Solar-powered cold storage unit to store crops

Activities

- Activity 2.2.4.1: Promote fast growing and drought resistant crop varieties.
- Activity 2.2.4.2: Provide inputs for irrigated agriculture technologies (Drip irrigation, small irrigation etc.).
- Activity 2.2.4.3: Promote climate-smart agricultural practices supported by innovative software/apps.
- Activity 2.2.4.4: Promote (cold) storage management to prevent decay of crops.



Strengthening the capacity of stakeholders to manage flood and drought risks due to climate change effects.

- 44. 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.
- 45. Component three 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 regarding flood and drought adaptation. The programme shall strengthen stakeholders' capacity to manage flood and drought risks. The programme shall develop capacity building and training plans.

46. The activities for this component are highlighted below under outcomes: 3.1 and 3.2 in outputs 3.1.1, 3.1.2 and 3.2.1.

Outcome 3.1: Flood and drought resilience of key stakeholders at national and sub-national level strengthened.

47. The adaptive capacity of people and institutions shall be strengthened through capacity building and supporting plans. Workshops, educational programmes, and training sessions shall be provided to key stakeholders at different levels of society. Simultaneously, plans shall be developed to support flood and drought risk management activities of the key stakeholders. Strengthened capacity of the key stakeholders enables sustainable resilience to flood and drought risks using the tools, technologies and practices implemented as part of the proposed programme.

Output 3.1.1: Flood and drought management plans (FDMPs) integrating climate change aspects and adaptation actions are developed.

48. There are likely 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. These plans shall be disseminated to relevant people and authorities.

Activities

- Activity 3.1.1.1: Develop/update existing FDMPs at national and sub-national levels integrating climate change elements and adaptation actions.
- Activity 3.1.1.2: Ensure alignment FDMPs with national and international climate objectives and national development plans and programs.
- Activity 3.1.1.3: Promote and disseminate FDMPs for use by stakeholder groups (e.g. disaster management authorities, farmers and pastoralists).
- Activity 3.1.1.4: Support effective adoption/embedding of FDMPs in governmental policies and practices e.g. by developing bylaws.

Output 3.1.2: Adaptive capacity of institutions, farmers, and pastoralists in flood and drought management is improved.

49. 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.

Activities

- Activity 3.1.2.1: Undertake a capacity needs gap analysis to effective flood and drought management.
- Activity 3.1.2.2: Develop capacity building plans and supporting materials/toolkits for national, regional, and local stakeholder groups including governmental organisations.

- Activity 3.1.2.3: Organise visits and learning tours for cross-learning in areas with successful flood and drought management innovations including best water management practices.
- Activity 3.1.2.4: Train stakeholder groups at all layers of society on how to operate and maintain flood and drought adaptation measures/technologies implemented as part of this project including mobile flood barrier, flood and drought early warning system, irrigation system and the water harvesting infrastructure.
- Activity 3.1.2.5: Train farmer and pastoralist groups innovative climate smart agricultural extension services. These smart agricultural services are supported by innovative software/apps.

Outcome 3.2: Partnerships for flood and drought management at national and sub-national level strengthened.

50. 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.

Output 3.2.1: New/existing national and sub-national arrangements/networks for flood and drought management supported.

51. 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 different stakeholders must agree on the arrangements to ensure that the flood and drought risk mitigating solutions are sustainable.

Activities

- Activity 3.2.1.1: Undertake gap analysis on agreements (e.g. MoUs) for flood and drought management between different stakeholder groups at different levels of society.
- Activity 3.2.1.2: Develop/upgrade national and regional flood and drought management multisectoral/stakeholder agreements and platforms to coordinate partner efforts. Ensure a periodical review of the agreements and platforms.
- Activity 3.2.1.3: Support national and regional partners to jointly mobilize resources for flood and drought management in a changing climate context.



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

52. 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.

53. The specific activities of this component are highlighted under outcomes 4.1 and 4.2 and outputs 4.1.1 and 4.2.1.

Outcome 4.1: Strengthened awareness and ownership of flood and drought adaptation and climate risk reduction processes at local level.

- 54. 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.
- 55. 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.

Output 4.1.1: Good practices and lessons on flood and drought management disseminated.

56. The proposed programme defines knowledge management objectives with the different stakeholders involved in flood and drought risk management. Subsequently, knowledge products are identified to realise knowledge management objectives. 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 management platform is used to share knowledge such as best practices, lessons learned and the realization of (inter)national objectives.

Activities

- Activity 4.1.1.1: 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 4.1.1.2: 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 4.1.1.3: 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 NDCs or SDGs.

Output 4.1.2: Flood and drought information management strengthened.

57. Knowledge sharing requires a paradigm shift by embedding related activities in business-asusual processes. Detailed runbooks are developed, and gatherings shall be organized to establish processes and procedures, and to define roles and responsibilities with regards to knowledge sharing. A Monitoring and Evaluation expert will be appointed who is responsible for measuring and reporting on the flood and drought risk management impact that is realised with the implemented adaptation tools, technologies and practices.

Activities

- Activity 4.1.2.1: Develop runbooks describing actions to be taken by different stakeholder groups with different types of flood and drought information and knowledge.
- Activity 4.1.2.2: Engage policymakers in the dissemination of flood and drought management information and best practices.
- Activity 4.1.2.3: Support flood and drought management working groups to share and disseminate the information. This involves organizing workshops and meetings for vulnerable groups of women and youth to share and disseminate information on drought management.
- Activity 4.1.2.4: Establish monitoring and evaluation activities and therewith facilitate empowerment of women, children, and other vulnerable groups on water management.

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

- 58. 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.
- 59. 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.
- 60. 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 might be customized to meet local specific requirements.
- 61. Weather information services such as EWSs 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.
- 62. 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 EWSs 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 harvesting infrastructure and (iii) an innovative irrigation system will be implemented to support stakeholders.

- 63. 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 will be a new way of farming and consumption for farmers and community members.
- 64. 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 not only to operate and maintain the innovative climate adaptive interventions, but also to extract as many benefits of them as possible.
- 65. 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.
- 66. 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. This will be possible through facilitating producers to participate in (i) interviews, (ii) business tours, (iii) supporting producers in trade shows, (iv) business forums etc. T
- 67. The programme shall also explore the possibility to introduce and promote innovative insurance Index-based weather insurance in partnership with insurance companies. Insurance products will be promoted that could help stakeholders reduce and offset climate change-related losses.
- 68. 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

69. 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.

- 70. The relevant project teams shall (i) hold workshops (brown paper sessions), (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.
- 71. 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 (white paper sessions), (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.
- 72. 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.
- 73. 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.
- 74. The co-design process leads to agreed implementation plans. Design and execution of these plans are done in separate projects with the programme organized by the type of interventions: (i) information technology, (ii) technical/physical interventions and (iii) capacity building and knowledge management.
- 75. 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 and it is authorizes 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.
- 76. 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 from the M&E team. The committee is mandated to decide how to follow-up with the analysis and recommendations by the M&E team.

- 77. 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 countries in Africa experience adverse impacts from climate change-induced flood and drought events and they are eager to find a solution.
- 78. 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

- 79. The programme is designed to realise the most economic, social, and environmental benefits especially for the most vulnerable groups. These benefits will be aligned with national and international (climate) objectives as included in national adaptation plans and strategies. 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 methodology and a monitoring methodology.
- 80. 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 in monetary and non-monetary values. Additional information services and toolkits support measuring and monitoring adaptation benefits. 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).
- 81. The benefits are described in below paragraphs and an overview of the benefits is included in Table A in Annex 1.

Socio-Economic benefits

- 82. 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 improving water security will improve the livelihoods of farmers and pastoralists and by extension other vulnerable groups such as women and youth.
- 83. 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 EWSs. By implementing EWSs and other weather information services, the programme will reduce the number of casualties and injuries.

- 84. 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.
- 85. 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.
- 86. 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.
- 87. 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.
- 88. 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.
- 89. 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.
- 90. Overall, the planned interventions of the proposed programme provide concrete socioeconomic 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 four selected provinces will receive flood and drought resilient technologies such as water-filled mobile flood barriers and irrigation systems. 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

91. 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.

- 92. 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 as it stands. It is therefore imperative that the programme creates awareness and conveys the message that benefits for the environment and socio-economic benefits are intertwined.
- 93. 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.
- 94. 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.
- 95. 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.
- 96. 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 workshops, lessons learned sessions, 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 practices, tools and technologies to protect, restore and manage the environment and biodiversity.
- 97. 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

- 98. The programme is cost-effective throughout its four 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. 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. An important feature of the innovative adaptation tools, technologies and practices is that these are more cost-effective compared with the (conventional) alternative solutions.
- 99. 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.
- 100. 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.
- 101. 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. A similar analysis will be conducted as part of the feasibility study for the full proposal.
- 102. 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 water tower or 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 cold storage facilities that are powered by generators.
- 103. Under the third component, the programme will mainstream climate change adaptation in the water sector into existing strategic and operational frameworks (national strategies, policies,

development plans, planned programs etc.) instead of developing new plans and frameworks. As such, the programme will support a cost-effective approach while also encouraging national ownership over the programme outputs.

- 104. Furthermore, the third component aims to raise awareness and strengthen capacities mainly in flood and drought adaptation across different stakeholder groups at different levels of society. The enhanced activities include climate smart agricultural and pastoral practices in various institutions at the national and sub-national level. Capacity building activities include "train-the-trainer" workshops to ensure that local people can train others as opposed to involving foreign, more expensive, trainers.
- 105. The fourth 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 therefore funds.
- 106. 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.
- 107. Lessons learned from past projects confirm that costs can be saved by holding multidisciplinary 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.
- 108. The project 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

- 109. 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 United Nations Framework Convention on Climate Change (UNFCCC) conferences and agreements.
- 110. 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)²³. 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.
- 111. In 2012, Burundi finalised its National Climate Change Strategy and Action Plan²⁴. 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.
 - Develop and strengthen institutions, mechanisms and capacities to build resilience to hazards.
 - Systematically consider risk reduction in emergency preparedness/response/recovery activities²⁵.
- 112. Burundi submitted its First NDC in January 2018 to the UNFCCC²⁶. In its NDC Burundi presents itself as being vulnerable to climate change. It projects that climate change affects 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); FDR1 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.

²³ Burundi Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

²⁴ Nile Basin Initiative (2013): Climate Change Strategy. www.nilebasin.org/index.php/media-center/publications/doc_down- load/104nbi-climate-change-strategy

²⁵ HFA (2015): Burundi - Rapport national de suivi sur la mise en oeuvre du Cadre d'action de Hyogo (2013-2015) - Interim

²⁶ The First NDC is the INDC that was submitted to September 2015 prior to the Paris COP

- Reinforcement of climate change impact tracking systems by means of observations and investigations.
- Strengthening of the information and data communication and exchange system.
- Burundi has ratified a Technology Needs Assessment (TNA)²⁷ and a Technology Action 113. Plan (TAP)²⁸ 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.
- 114. 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 the respective national adaptation priorities and corresponding national and international objectives. Table B in Annex 1 reflects how this programme contributes to and complies with relevant national/regional strategies, plans and programs.
- 115. 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). 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)
- 116. 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 Sustainable Development Goals (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

 $^{^{27}} https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/e2a748d4d7fb46a886411a2739cf72d7/eb976df133a34e74b758e3e22fd15490.pdf$

²⁸https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/2f913115be3049faa26a1e1a7facbfe7/3f6fe789960247acbee7 11dda0cbfd72.pdf

- 117. 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.
- 118. 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.
- 119. 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 C and D in Annex 1 reflect linkages between the standards and the planned activities of the project.
- 120. 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 project 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, flood and drought EWS, crops and livestock production and training of target audiences. Controls will be put in place to limit the risk of social or environmental harm.
- 121. Note that not all laws related to the principles set forth by the Adaptation Fund have been ratified by the Government of Burundi. Where the laws have not been ratified, the programme will adhere to the (spirit of) the Environmental and Social principles as published by the AF.

H. Duplication of the programme with other funding sources

- 122. 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).
- 123. 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.
- 124. Table E in Annex 1 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.

- 125. It is imperative to conduct gap analyses at an early stage of the project 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.
- 126. Table F in Annex 1 provides a mapping of the core interventions and possible duplication with planned, ongoing, and completed programs that ought to be addressed during gap analyses.
- 127. 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 to what extent the possible duplication impacts this programme, the results of which shall be included in the full proposal.

I. Learning and knowledge management

- 128. 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.
- 129. 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 (short- and long-term) that are systematically pursued and eventually achieved through proper resource planning.
- 130. 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.
- 131. 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.

- 132. 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.
- 133. 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 G in Annex 1, determine the most effective actions and knowledge management results most consistent with overall project objectives.

- 134. 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.
- 135. The generated knowledge will be used by the different partners to improve and adjust the implementation of the programme, for political dialogue 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 project. This includes knowledge products on the innovative flood and drought adaptation practices, tools, and technologies such as water-filled mobile flood barriers. Knowledge products shall be publicly accessible and widely disseminated.

J. Consultative process

- 136. 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 of the programme. Ultimately, all stakeholders should work towards a shared objective.
- 137. 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 of Burundi who is the focal point of the AF.
- 138. The consultation process was carried out by organizing online and onsite meetings with local authorities, field visits and workshops with community members. Events such as meetings and workshops aimed to have representatives of as many stakeholder groups as possible. The

discussions also focused on identifying and validating the threats/problems and needs of the selected territories. This enabled a consensus on the objectives, results and measures to respond to problems. The table below reflects the distribution of participants in consultations.

Table 3: Overview consultations and number of participants

Participants	Men	Women	Disabled	Elders	Youth	Indigenous
Consultation	Consultation session 1: Online session with meteorologists and hydrologists on national level.					
Public:						
Private:						
Total:						

139. All participants in the consultation process were provided with a brochure/booklet 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.
- 140. 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.
- 141. Preliminary discussions were held with 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.
- 142. The key takeaways from the consultations are:
 - Participants understand what the proposal development processes.
 - Participants understand the project objectives and scope.
 - There is a broad consensus on the flood and drought risks and the adaptation needs.
 - Participants provided substantive and valuable feedback that shall be incorporated in the design of the programme.
- 143. The programme applies a feedback mechanism to allow for stakeholders' views to be heard during project 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.

144. The consultation process will be expanded upon during the development of the full proposal. Parties involved in developing the full proposal shall agree on additional consultation needs for the full proposal.

K. Drawing on multiple perspectives on innovation.

- 145. 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.
- 146. 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*"²⁹. The co-design process and the establishment of partnerships follows four stages:
 - 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.
- 147. 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. The table below provides an initial overview of the key stakeholders that are part of each partnership in this programme.

Table 4: Overview consultations and number of participants

Key stakeholder		Partnership 1	Partnership 2	Partnership 3	Partnership 4	
(i)	Customers					
1.	Produce export traders	√			\checkmark	
2.	Smallholder farmers	\checkmark	\checkmark	\checkmark	\checkmark	
3.	Pastoralists	\checkmark	\checkmark	\checkmark		
4. Representatives of agricultural cooperatives			~	~	~	
(ii)	(ii) Community					

²⁹ https://d-lab.mit.edu/resources/publications/pact-partnership-co-design-toolkit

5. Farmer families (community)	\checkmark	\checkmark	\checkmark	~
6. Women's association	\checkmark	\checkmark	\checkmark	√
7. Indigenous peoples	\checkmark	\checkmark	\checkmark	\checkmark
8. Civil society	\checkmark	\checkmark	\checkmark	\checkmark
(iii) Partners				
9. Environmental expertise/field	\checkmark			
10. Agricultural industries			\checkmark	\checkmark
11. Extension agents (e.g. training institutes)			\checkmark	\checkmark
(iv) Institutions				
12. Disaster preparedness and management	\checkmark	\checkmark		
13. Hydrology department	\checkmark			
14. Environmental protection department		\checkmark		
15. Agriculture and Livestock Research Institution		✓	\checkmark	~
16. Provincial Technical Services (Agriculture and Livestock)	\checkmark	✓	\checkmark	~
17. Territorial administration		\checkmark		
18. Local government	\checkmark	\checkmark		
19. Regional/provincial government	\checkmark	\checkmark		
20. Grant funder	\checkmark			\checkmark
21. Financial institutions (incl. insurer)	\checkmark	\checkmark		
22. Embassy of the Netherlands in Burundi		\checkmark		
23. University of Burundi		\checkmark	\checkmark	
24. University in the Netherlands		\checkmark	\checkmark	

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
- 148. 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.
- 149. 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.

- 150. 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.
- 151. The project aims to maximize the funding amount for the concrete adaptation component (component 2). Funding allocation to the other (softer) components is required for complementarity/support for component 2 and sustainability and quality assurance of the programme.
- 152. 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.
- 153. 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

154. An alternative without the proposed Adaptation Fund supported programme is a "business as usual" situation. Floods and drought 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 decades³⁰. 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 earnings³¹. Extreme floods and droughts are estimated to result in a reduction of long-term growth by 2.4% of GDP per year³².

³⁰ Baramburiye et al. (2013)

³¹ 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

³² DFID (2011): The economic impacts of climate change in Burundi. http://weadapt.org/knowledge-base/economics-of-adaptation/ economics-of-adaptation-burundi

- 155. 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 flood and drought occurrences and high environmental degradation.
 - Communities inhabiting such sites continue to be food insecure characterized by recurrent famine and a shortage of food.
 - There continue to be 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 will remain.
 - Smallholder farmers and pastoralists have limited options in terms of the potential alternative sources of livelihoods and income.

Programme with Conventional Adaptation Measures

- 156. 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.
- 157. 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. NBSs (Nature Based Solutions) can be effective but it often takes a long time for these solutions to develop; this poses a challenge seeing as the need for effective adaptation measures is urgent.
- 158. 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

159. 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 OECD (Organization for Economic Cooperation and Development) (1992), for evaluation and comparison of international development projects,

which are: (i) Relevance, (ii) Effectiveness, (iii) Sustainability, (iv) Efficiency and (v) Impact. Each of the criteria has multiple sub-criteria. The outcome of this analysis is included in Table H in Annex 1.

- 160. 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 an FEWS (Flood Early Warning System), complementary to the mobile flood barrier.
- 161. 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

- 162. 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. It is imperative that roles and responsibilities are clearly defined and agreed upon.
- 163. The sustainability of the programme is furthermore enables 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.
- 164. 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 of the programme.
- 165. The programme shall use the ABM methodology to define anticipated and realised ABs from implementing the activities as defined. Using that methodology, the programme sets targets based on the AB-analysis and ensures that relevant stakeholder take ownership of realizing these targets well after the programme has been completed.
- 166. 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 ABs. It is imperative that the team comprises of representatives of vulnerable groups such as women and youth. The programme also provides a toolkit to record ABs per flood and drought event and per

period. The ex-post analysis is further enlightened in the ABM methodology and requires data collection through methodologies such as interviews and field visits.

- 167. 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.
- 168. As part of components 1 and 4, 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.
- 169. 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

- 170. The programme recognizes that with similar initiatives in the water sector, there are inherent environmental and social risks that must be analyzed. The programme analyzes these risks in accordance with the Environmental and Social Policy (ESP) and Gender Policy of the Adaptation Fund. The outcome of the risk analysis clarifies the gender-specific cultural and legal context of the programme.
- 171. 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.
- 172. The programme is classified as a Category C programme meaning that is has no adverse environmental or social impacts. The reasoning behind this categorization is that the aim of the programme is to improve environmental and social impacts using inputs from especially vulnerable groups in target communities. Implementation of adaptation tools and technologies shall consider possible adverse impacts before and during the implementation. The programme shall redesign the adaptation tools and technologies to prevent adverse impacts in case the feasibility study indicates that there are adverse impacts.
- 173. Despite of the Category C classification, the programme shall identify and assess all environmental and social risks for the full proposal in an open and transparent manner with appropriate consultation. The programme describes the assessment approach and ensures that

it meets the requirements of the policy. The full proposal includes a grievance mechanism that facilitates grievances in a transparent manner. The programme shall also develop a monitoring program commensurate with actions identified in the Environmental and Social Management Plan (ESMP) to ensure that appropriate actions are taken in a timely manner.

174. The result of the screening process is included in below table depicting which environmental and social risks are triggered by the programme and require more detailed environmental and social assessment. The completed checklist furthermore indicates which risks do not require any further assessment to achieve full compliance with the ESP. In case a more detailed assessment is required, the programme shall elaborate on the inherent risks and which measures shall be implemented to realise a managed risk level that is in line with the risk tolerance level. The risk tolerance level includes, at a minimum, mitigating measures that ensure that the programme is in full compliance with the ESP of the Adaptation Fund.

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	 <i>Risk chance</i> Low probability as most programme activities are not bound by laws. <i>Risk potential impact</i> Very high seeing that in adherence to laws can result in a cancelation of the programme. <i>Further assessment and management</i> 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.	 <i>Risk chance</i> Very low probability as most benefits cannot be allocated to specific groups. <i>Risk potential impact</i> High seeing as this could impede access of any group to the essential services and rights. <i>No further assessment</i> 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

Table 5: Checklist environmental and social risks and compliance with the ESP

			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	 <i>Risk chance</i> Very low probability as the programme aims to help marginalized and vulnerable groups improve their living conditions and quality of life. <i>Risk potential impact</i> High seeing as adverse impacts would deteriorate the wellbeing of marginalized and vulnerable groups and exacerbate the equality gaps. <i>Further assessment and management</i> 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 chanceLow probability as the programmeaddresses human rights duringconsultations.Risk potential impactVery high seeing as human rightsviolations are detrimental for thewellbeing of people whom theprogramme is trying to help. Violationscan also lead to a cancellation of theprogramme.

				<i>Further assessment and management</i> 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	 <i>Risk chance</i> 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. <i>Risk potential impact</i> High seeing as adverse impacts could deteriorate the wellbeing of women and exacerbate the gender gap. <i>Further assessment and management</i> 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 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 codesign 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	 <i>Risk chance</i> 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. <i>Risk potential impact</i> High seeing as adverse impacts could deteriorate the rights of labourers. Violation of ILO standards can lead to cancellation of the programme. <i>Further assessment and management</i> 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.
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 chanceVery low probability as indigenouspeoples are hardly present in theprogramme implementation area.Risk potential impactMedium seeing as the programmeactivities to a great extent cannot lead toadverse impacts for indigenous people.No further assessmentThe programme identifies indigenouspeople and involves them in theconsultations and programme activities.	N/a

			Monitoring activities will be implemented to ensure rights are not violated.	
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.	 <i>Risk chance</i> Very low probability as the programme explicitly aims to prevent the need of resettlement by enhancing resilience to floods and drought. <i>Risk potential impact</i> Medium seeing as there are programmes in place to support people in resettling. <i>No further assessment</i> 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 conducted to analyse flood and drought events and their impact on communities. 	N/a
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 	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.	 will identify natural habitats and monitor benefits or adverse impacts. <i>Risk chance</i> Very low probability as the programme explicitly aims to prevent damage caused by flood and drought events therewith protecting biodiversity. <i>Risk potential impact</i> High seeing damage to natural habitats might be difficult to restore. <i>No further assessment</i> 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 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.	N/a
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 chanceLow seeing as the programme aims toimplement tools and technologies thatare driven by clean energy.Risk potential impactHigh seeing as an issue mightexacerbate the negative impacts ofclimate 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 standards or implement mitigating measures caused by improper design of the programme assigning responsibilities on the subject matter.	N/a	 <i>Risk chance</i> Low seeing as the programme aims to implement tools and technologies that are climate friendly. <i>Risk potential impact</i> High seeing as an issue might lead to excessive costs or pollution negatively impacting the environment or people. <i>Further assessment and management</i> 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 chanceVery low probability as the programmeexplicitly aims to improve public health byreducing vulnerabilities to flood anddrought.Risk potential impactHigh seeing as the population couldsuffer injuries or health issuesNo further assessment	N/a

		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.	
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 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.	 <i>Risk chance</i> Very low probability as there is hardly any presence of cultural heritage in or near the programme. <i>Risk potential impact</i> Medium seeing as the population could suffer injuries or health issues <i>No further assessment</i> 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. 	N/a
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.	 <i>Risk chance</i> Very low probability as the programme explicitly aims to prevent degradation or conversion of productive lands that provides valuable ecosystem services. <i>Risk potential impact</i> High seeing degradation or conversion of productive lands or land could damage the ecosystem and livelihoods. <i>No further assessment</i> 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 	N/a

	or land. The programme shall identify the presence of fragile soils and productive land that provides valuable ecosystem services within the programme area.	

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)33	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)

³³ 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 government³⁴ 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*

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, <u>commit to</u> <u>implementing the project/programme in compliance with the</u> <u>Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

Name & Signature Implementing Entity Coordinator

Date: (Month, Day, Year)	Tel. and email:
Project Contact Person:	
Tel. And Email:	



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]

REPUBLIQUE DU BURUNDI



MINISTERE DE L'ENVIRONNEMENT, DE L'AGRICULTURE ET DE L'ELEVAGE

Gitega, 28 November 2022



Office Burundais pour la Protection de l'Environnement

N. Réf. : 003/2022/AND/FA/BDI

Letter of Endorsement by Government

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

Subject: Endorsement for the National Project « Strengthening flood and drought resilience for communities including farmers and pastoralists in Burundi »

In my capacity as designated authority for the Adaptation Fund in **Burundi**, I confirm that the above national grant proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the western region of Burundi.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by the **United Nations Environment Programme (UNEP)** and executed by **Office Burundais pour la Protection de l'Environmement (OBPE)**.

Sincerely,

Liévin NDAYIZEYE



B.P. 56.Gitega • Tél. (257) 22403031 •Téléfax: (257) 22403032 B.P. 2757 Bujumbura • Tél. (257) 22254255 Email: <u>obpe_burundi@obpe.bi</u> Site web : www.obpe.bi

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Annex 1: Additional tables to be used in the Full Proposal

Table A.: Benefits of the project

Project outcome	Economic benefits	Social benefits	Environmental benefits
Outcome 1.1: Increased use 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.

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: Flood and drought resilience of key stakeholders at regional, national and local levels strengthened.	 Improved capabilities to create economic value from flood and drought resilient adaptation practices, tools and technologies. 	 Flood and drought management plans bring together various (public and private) organisations at all levels of society. 	 Equal distribution of land and water to support the environment and the population.
Outcome 3.2: Partnerships for flood and drought management at regional, national and local levels strengthened.	 Creation of new jobs by intensified collaboration between different organisations and communities. Improved value chain related to crops and livestock products to increase economic value. 	The participation and involvement of people will contribute to develop long-term sustainable products and services which will be beneficial in increasing personal and national growth.	 Improved "checks and balances" to ensure protection, restoration and management of the environment.
Outcome 4.1: Knowledge and awareness on flood and drought risks management is increased.	 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 	 Improved understanding amongst various organisations and communities on how to protect the environment.

		community and the need for an enhanced role by the community	
	•	Strengthening the active participation of vulnerable populations in decisions linked to climate change.	

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

Strategy/plan/program me	Year published	Priorities	Programme compliance/contribution
1. Strategic plan: National Action Plan for Adaptation (NAPA) ³⁵	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 ³⁶	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.).

³⁵ Burundi Ministry for Land Management, Tourism and Environment (2007), in Baramburiye et al. (2013)

³⁶ Nile Basin Initiative (2013): Climate Change Strategy. www.nilebasin.org/index.php/media-center/publications/doc_down- load/104-nbi-climate-change-strategy.

			Risk appetite is defined and adaptive measures and practices to reduce disaster risks are included in plans.
3. Strategic plan: Nationally Determined Contributions (NDC) ³⁷ / 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.
		 and communication. Enhancement of data and information management and distribution mechanisms. Strengthening of the information and data communication and exchange system. 	 and communication. Weather data will be collected and information management will be standardised and centralised.

³⁷ Republic of Burundi (2018). Nationally Determined Contribution. Available via http://www4.unfccc.int/ndcregistry/PublishedDocuments/ Burundi%20First/CPDN%20BURUNDI.pdf

		 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. ³⁸	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). ³⁹	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. Integrate climate and environmental issues into water and resources sanitation improvement strategies/plans and develop 	 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. Implementation of smart agriculture practices and development of flood and drought

³⁸ https://www.presidence.gov.bi/wp-content/uploads/2018/08/PND-Burundi-2018-2027-Version-Finale.pdf

³⁹ https://unfccc.int/sites/default/files/resource/Burundi%20TNC%20executive%20summary.pdf

		risk assessments and measures for emergency situations.	 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. ⁴⁰	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
			 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. ⁴¹	2012	 Prevention and management of water-related disasters and protection of Water Resources. Instruments for the Integrated Management of Water Resources. 	Implementation of innovative adaptation practices, tools and technologies to enhance resilience to floods and drought including information services and flood barriers.
		Cooperation for the management of shared water resources with involvement of women	 Development of flood and drought management plans and creating MOUs/partnership agreements.

⁴⁰ http://obpe.bi/images/pdf/Strategie_Degration_des_terres.pdf

⁴¹ https://www.pseau.org/outils/ouvrages/meeatu_strategie_nationale_de_l_eau_2011_2020_1970.pdf

		and special consideration for vulnerable groups.	 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. ⁴²	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 Assessment – Adaptation. ⁴³	2016	 Water Resources sector Monitoring water quantities. Harnessing rainwater Control of the rain dynamics. Agriculture and Livestock sector 	 Implementation of hard- and software to monitor weather/hydrodynamic data. The implementation of water harnessing infrastructure using innovative technologies.

⁴² http://extwprlegs1.fao.org/docs/pdf/Bur190783.pdf

 $^{^{43}} https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/e2a748d4d7fb46a886411a2739cf72d7/eb976df133a34e74b758e3e22fd15490.pdf$

		• [Soil conservation systems. Development of the short cycle rice variety Community early warning systems	•	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. ⁴⁴	2018	• A	As per above	•	As per above
11. Programme: Climate proofing food production investments in Imbo and Moso basins in the Republic of Burundi. ⁴⁵	2020	• E ttl c p a v	Transforming current agro-ecological land and water management practices in the upper, middle, and lower Imbo and Moso catchments owards more sustainable and productive land use practices. Build farmers' resilience to climate change in he 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.	•	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.
12. Programme: Community Disaster Risk Management in Burundi (<i>Bugesera,</i>	2012	ir V	Early warning systems (on climate change nduced risks including new or emerging vulnerabilities and hazards) established for communities.	•	Implementation of information services including flood and drought early warning systems.

 $^{^{44}\} https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_key_doc/faba3d9fb058453bb241a7c2b4d0c640/3239bd8f111e4c5b806077e759c98ad0.pdf$

⁴⁵ https://www.greenclimate.fund/sites/default/files/document/sap017-ifad-burundi.pdf

Mumirwa and Imbo LowlandsÕ regions) ⁴⁶	Livelihoods and infrastructure risk assessment undertaken with gender-focused analysis.	 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.
	 Policy actions undertaken on the basis of anticipated climate change projections. Flood Control in Bujumbura. 	 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.

⁴⁶ https://www.thegef.org/projects-operations/projects/4990

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. ⁴⁷	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
	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. ⁴⁸	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]

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

⁴⁷ https://www.obpe.bi/images/pdf/cadreGestion.pdf

⁴⁸ https://www.obpe.bi/images/pdf/cadreGestion.pdf

2. Access and Equity	Law No. 1/02 of March 26, 2012 on the Water Code in Burundi and its implementing texts. ⁴⁹	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
	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. ⁵⁰	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 compensation to owners and holders of other land rights on the non-state part of the perimeter in	•	 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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]

⁴⁹ https://www.obpe.bi/images/pdf/cadreGestion.pdf

⁵⁰ https://www.obpe.bi/images/pdf/cadreGestion.pdf

			question, in accordance with the provisions of the land code in expropriation in the public interest (Article 10).		
3.	Marginalized and Vulnerable Groups	Article 22 of the Constitution of 18 March 2005. ⁵¹	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 political convictions or for being a carrier of HIV/AIDS or any other incurable illness.	•	 Activity 3.1.1.1: Flood and drought management plans 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 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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
4.	Human Rights	Article 52 of the Constitution of 18 March 2005. ⁵²	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.

⁵² https://tbinternet.ohchr.org/_layouts/15/treatybodyexternal/Download.aspx?symbolno=E/C.12/BDI/1&Lang=en

				•	Activity 3.2.1.2: Flood and drought management multi-sectoral/stakeholder agreements include sections about prevention of discrimination. The [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
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 	•	Activity 3.1.1.1: Flood and drought management plans reflect the roles and responsibilities of the people involved. The project ensures that the interest of women will be considered when implementing flood and drought adaptation.
			 environment conducive to the achievement of gender equality. Promote the mainstreaming of gender into development interventions in all areas. 	•	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
			 Strengthen equitable access of women, men, and adolescents to social services. 		multi-sectoral/stakeholder agreements include sections about involvement of women where relevant. The aim is to have women in higher functions with regards to flood and drought adaptation.
					The [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
6.	Core Labour Rights	Decree Law No. 1/037 of 07/07/1993 revising the labor code of the Republic of Burundi. ⁵³	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 hygiene and safety of workers, 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 such as women will benefit from flood and drought adaptation.

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

			organisation and operation of corporate medical and health services,and special working conditions for pregnant women and young people".	•	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
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. ⁵⁴	•	 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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
8.	Involuntary Resettlement	The Land Code of the Republic of Burundi,	The law provides the procedure for resettlement. Responsibility for resettlement lies with the Ministry of	•	Activities 2.1.1.1 and 2.2.1.1: Development of flood and drought scenarios takes into consideration settlements.

⁵⁴ https://www.ifad.org/documents/38714170/40224460/burundi.pdf/969773f0-9429-49d3-bccf-d02d4cbcdac4?t=1651742303327

Law No. 01/008 of 01/09/1986. ⁵⁵	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 2.1.2.1., 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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
AFRICAN DEVELOPMENT BANK OP. 4.12 (INVOLUNTARY RESETTLEMENT). ⁵⁶	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 project implementation, whichever is higher.	•	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 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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]

⁵⁵ 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

⁵⁶ 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

9.	Protection of Natural Habitats	Law No. 1/10 of May 30, 2011 on the creation and management of protected areas in Burundi. ⁵⁷	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
		Law No. 1/02 of March 26, 2012 on the Water Code in Burundi and its implementing texts. ⁵⁸	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 these areas, except for irrigation works.	•	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
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). ⁵⁹	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	•	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.

⁵⁷ https://www.obpe.bi/images/pdf/cadreGestion.pdf

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

⁵⁹ https://www.obpe.bi/images/pdf/cadreGestion.pdf

		and reproduction of the species that inhabit the water at the time of carrying out these works, structures and developments (section 53).		The [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
	Law No. 1/28 of 24/12/2009 relating to the health policy of domestic, wild and aquaculture animals and bees. ⁶⁰	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
11. Climate Change	The United Nations Framework Convention on Climate Change (UNFCCC). ⁶¹	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
12. Pollution Prevention and Resource Efficiency	Law No. 1/02 of March 26, 2012 on the Water Code in Burundi and its implementing texts. ⁶²	Appropriate measures must be taken at all levels to ensure efficient management of resources and infrastructures, and to reduce the	•	Activity 3.1.1.1: Flood and drought management plans describe how to ensure efficient management of water and supporting infrastructures.
		costs of water services.	•	Activities 3.1.2.1, 3.1.2.4 and 3.1.2.5: Capacity building of various stakeholder groups and innovative

⁶⁰ https://www.obpe.bi/images/pdf/cadreGestion.pdf

⁶¹ https://www.obpe.bi/images/pdf/strategic_framework_environment_management.pdf

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

				adaptation practices enable efficient management of water and supporting infrastructures. The [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
13. Public Health	Decree 100/177 of July 9, 2013 on health inspection measures for animals and food products of animal origin. ⁶³	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. The [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
	Decree-Law No. 1/033 of June 30, 1993 on plant protection in Burundi. ⁶⁴	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
14. Physical and Cultural Heritage	Law No. 1/6 of May 25, 1983 on the protection of the National Cultural Heritage. ⁶⁵	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,	•	 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

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

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

⁶⁵ http://www.african-archaeology.net/heritage_laws/burundi1983.html

		repaired, transformed or restored without the prior authorization of the Minister of Culture, taken on the assent of the Commission.	•	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. The [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]
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). ⁶⁶	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]

⁶⁶ https://www.obpe.bi/images/pdf/cadreGestion.pdf

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

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. ⁶⁷	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 [INSERT AUTHORITY] will monitor compliance with this law and national standards through [EXPLAIN HOW]

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

Table E: 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. ⁶⁸ 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 (<i>Bugesera,</i>	Early warning systems (on climate change induced risks including new or emerging	Region Bugesera, Mumirwa and Imbo Lowlands.	 (Non) Duplication Both programs cover Bujumbura Rural Province which is in the Imbo Lowlands Region.

⁶⁸ https://www.greenclimate.fund/sites/default/files/document/sap017-ifad-burundi.pdf

Mumirwa and Imbo Lowlands regions) ⁶⁹ Approved 2014 3. Programme:	 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. 	 Deliverables 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.
Restructuring of the Value Chain	contribute to increasing incomes and improving the food	Negion	The programme also covers Cibitoke and Bubanza Province.

⁶⁹ https://www.thegef.org/projects-operations/projects/4990

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Development Programme (PRODEFI) ⁷⁰ <i>Approved 2015</i>	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. <i>Alignment</i> 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 ⁷¹ <i>Approved 2016</i>	 Restore degraded landscapes by community members in two priority regions, and in the event of an eligible crisis or 	Region (North-West region) Bubanza, Kayanza, Bujumbura Rural, (East region) Cankuzo, Ruyigi and Muyinga Province	 (Non) Duplication The programme also covers Bubanza and Bujumbura Rural Province. The programme will conduct capacity building of local institutions, though not specifically on land restoration; it

 $^{^{70}} https://www.ifad.org/documents/38711624/40089492/PRODEFI+II+Rapport+de+conception+dtaille.pdf/6b0c1812-9550-4763-9d46-a26dc6ce7b73?t=1611227252000$

⁷¹ https://documents1.worldbank.org/curated/en/408471487004538339/pdf/ITM00184-P160613-02-13-2017-1487004534488.pdf

	emergency, to provide immediate and effective response to said eligible crisis or emergency.	 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. 	 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. <i>Alignment</i> 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:	Address the root causes of	Region	(Non) Duplication
Natural Landscapes Rehabilitation and Climate Change	landscape degradation due to climate change and unsustainable land uses	Region of Mumirwa in Bujumbura Mairie and in the Lake Tanganyika coastal area.	 The programme covers Bujumbura Marie and part of the Lake Tanganyika coastal area.
Adaptation in the Region of Mumirwa	by rehabilitating degraded land and adapting	Deliverables	The programme identifies, prioritizes, implements, monitors and evaluates adaptation strategies, but
in Bujumbura and Mayor of Bujumbura	integrated farming and natural systems to climate	 Training to identify, prioritize, implement, monitor and 	centred around new adaptation measures.
through a Farmer	change in the.	evaluate adaptation strategies and measures.	• The programme conducts risk assessments, albeit with state-of-the-art modelling software and considering new adaptation measures.

Field School Approach ⁷² <i>Approved 2019</i>		 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 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.
6. Programme: Consultancy to support delivering climate resilient and sustainable water services to rural	Provide technical assistance: (a) to undertake a climate risk assessment in five provinces in Burundi with a focus on water resources,	 <i>Region</i> Five (undisclosed) provinces. <i>Deliverables</i> 	 (Non) Duplication Although undisclosed, the four provinces of the programme are expected to be in scope of the planned programme.

⁷² https://www.thegef.org/projects-operations/projects/8010

communities in Burundi. ⁷³ <i>Planned for 2023</i>	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.	 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. 	 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. <i>Alignment</i> 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.
7. Programme:	Improve local	Region	(Non) Duplication
Community Disaster Risk Management in	communities' capacities on climate disaster risks	 Kirundo, Bujumbura Rural, Bururi and Makamba. 	The programme covers Bujumbura Rural.
Burundi. ⁷⁴	preparedness and responses management to	Deliverables	• The programme will implement a flood and drought early warning system for Bujumbura Rural as well as a
Approved 2014	ensure long term and sustainable emergency and reconstruction phase	 An operational Community Based Early Warning system established capable to engage 	platform on national level. There is a risk of duplication that shall be further explored.
	in Bugesera, Mumirwa and Imbo Lowlands' regions.	and reach out target communities for climate change disasters risks prevention and guiding the implementation of adaptation activities.	• The programme will upgrade the hydrometeorological network and improve capacity to generate real-time information weather and data for information dissemination to target communities. There is a risk of duplication that shall be further explored.

⁷³ https://gca.org/wp-content/uploads/2022/08/GCA-PR-22-184-REOI-Climate-Resilient-and-Sustainable-Water-Services-in-Burundi-_Final95.pdf

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

		 Communal services, relevant ministry support services and Provincial disaster risks platforms trained to use climate risks management tools for long term planning under climate change variability and projections. Investment on relevant early warning systems and adaptation technologies to protect infrastructures and local livelihoods from climate impacts. 	 The programme will setup an effective and efficient communication and dissemination system to reach all end users. There is a risk of duplication that shall be further explored. The programme will conduct risk and vulnerability assessments and response strategies, but taking into account the new adaptation measures. The programme will invest in flood and drought adaptation tools and technologies, albeit different intervention compared to the completed programme. <i>Alignment</i> The programme will improve local communities' capacities on flood and drought disaster risks preparedness and responses management using innovative adaptation practices, tools and technologies.
8. Programme: Great Lakes Regional Integrated	To increase agricultural productivity and commercialization	 Region Ruzizi Plain and the Imbo region, and the geographic 	 (Non) Duplication The programme covers (parts of) the Ruzizi Plain and the Imbo region.
Agriculture	in targeted areas in the	corridor along Lake Tanganyika	
Development Project. ⁷⁵	territory of the recipient and improve	Deliverables	The programme implements smart agriculture practices upported by incorpting active actives
	agricultural regional	 Facilitate farmers' access to 	supported by innovative software, though without improving access to production packages.
Approved 2017	•	improved production packages	1 · · · · · · · · · · · · · · · · · · ·
	integration.	improved production packages	
		(e.g. seed).	The programme will implement an irrigation
	To provide immediate	(e.g. seed).	infrastructure, though in a unique setup where excess
	 To provide immediate and effective response 	(e.g. seed).Promote the adoption of climate	infrastructure, though in a unique setup where excess

⁷⁵ https://projects.worldbank.org/en/projects-operations/document-detail/P161781?type=projects

 Strengthen capacity of water user associations to manage irrigation systems and improve watershed management. 	• The programme supports linkages with potential buyers of agriculture and livestock products but also by emphasizing used of new adaptation measures.
 Strengthening of selected Business Development Services (BDS) (to support value chains). 	 The programme implements knowledge sharing and learning using different channels, though focussed on new adaptation measures. Alignment
 Exchanges of information, knowledge, and technologies through channels such as a web-based exchange platform. 	• 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.

Table F.: Mapping* of possible duplications with other programmes

Programme outcome	Cibitoke	Bubanza	Bujumbura Rural	Bujumbura Mairie
Outcome 1.1: Increased use of effective	P3, P6	P3, P4, P6	P2, P4, P6,	P6
information technology by stakeholders.			P7	
Outcome 2.1: Increased uptake and usage	P1, P3, P5	P1, P3, P5	P1, P2, P5,	P1, P5
of concrete and innovative flood adaptation			P7	
actions.				
Outcome 2.2: Increased uptake and usage	P1, P3, P5,	P1, P3, P5,	P1, P2, P5,	P1, P5, P8
of concrete and innovative drought	P8	P8	P7, P8	
adaptation actions.				
Outcome 3.1: Flood and drought resilience	P1, P3, P5,	P1, P3, P4,	P1, P2, P4,	P1, P5, P6,
of key stakeholders at regional, national	P6, P8	P5, P6, P8	P5, P6, P7,	P8
and local levels strengthened.			P8	
Outcome 3.2: Partnerships for flood and	P3, P5, P8	P3, P4, P5,	P4, P5, P7,	P5, P8
drought management at regional, national		P8	P8	
and local levels strengthened.				
Outcome 4.1: Strengthened awareness	P3, P5, P6,	P3, P5, P6,	P2, P5, P6,	P5, P6, P8
and ownership of flood and drought	P8	P8	P7, P8	
adaptation and climate risk reduction				
processes at local level.				

* "P" in the table refers to the programme numbers in Table 6

Table G.: Overview knowledge management strategy

Expected Outputs	Type of knowledge	Target audience/communication means	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. 	 Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at national, regional and local level. Disaster management authorities at 	 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: Collected and stored data to support flood and drought information services.	Analysis of and experience with current flood and drought data and data management.	 <i>Target audience</i> Hydro/meteorological departments at national, regional and local level. <i>Communication means</i> Meetings Knowledge sharing platform 	 Results Shared understanding on how to enrich (high-quality) data and implement data management to support flood and drought information services. Knowledge products Baseline study Data management document
Output 1.1.3: Institutional linkages for information established.	 Analysis of and experience with current flood and drought information sharing frameworks. Analysis of and experience with new flood and drought 	 Target audience Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at national, regional and local level. Disaster management authorities at national, regional and local level. 	 Results Shared understanding on how to establish and improve flood and drought information sharing frameworks.

	information sharing frameworks.	 Other governmental bodies such as the Ministry of Environment, Agriculture and Livestock. Communication means Workshops Meetings Interviews/surveys Knowledge sharing platform 	 Knowledge on roles and responsibilities in the flood and drought information sharing framework is enhanced. <i>Knowledge products</i> Flood and drought information sharing platform Training plans/documents Lessons learned documents
Output 1.1.4: Feedback mechanism for information services developed.	 Analysis of and experience with current flood and drought feedback information platforms. Analysis of and experience with new flood and drought feedback information platforms. 	 Target audience 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. Communication means Meetings Surveys 	 Results Enhanced feedback mechanism to disseminate information on flood and drought risks and adaptation. Knowledge products Tools to access, utilize and report on flood and drought information
Output 1.1.5: Emergency plan for flood and drought management is put in place.	 Analysis of and experience with current flood and drought emergency response plans. Analysis of and experience with new flood and drought emergency response plans. 	 <i>Target audience</i> Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at national, regional and local level. Disaster management authorities at national, regional and local level. <i>Communication means</i> Workshops Interviews/surveys 	 <i>Results</i> 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. <i>Knowledge products</i> Emergency response plans

		Knowledge sharing platform	 Flood and drought information sharing platform 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. 	 <i>Target audience</i> 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. <i>Communication means</i> Meetings Workshops Travel Interviews/surveys Knowledge sharing platform 	 <i>Results</i> 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. <i>Knowledge products</i> Flood risk assessment Flood adaptation benefit analysis Flood information sharing platform Training plans/documents Lessons learned documents
Output 2.1.2: Enabling environment for flood adaptive activities created.	 Analysis of suitability of landscape/area to deploy a mobile flood barrier. Analysis of impact flood risks on agriculture and pastoralist value chain. Analysis of and experience with flood related insurance products. 	 Target audience 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. Insurance companies 	 Results Shared understanding of current suitability of landscape for mobile flood barriers and how to increase suitability. Shared understanding of the impact of flood risks on the agriculture and pastoralist value chain.

		 Communication means Meetings Travel Workshops Interviews/surveys Knowledge sharing platform 	 Increased knowledge of flood insurance products and applicability of interventions such as mobile barriers. <i>Knowledge products</i> Flood barrier situation analysis Landscape/area suitability matrix Agriculture and pastoralist value chain assessment Flood risk insurance analysis
Output 2.1.3: Innovative 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. 	 Target audience Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at local level. Disaster management authorities at local level. Communication means Meetings 	 <i>Results</i> 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. <i>Knowledge products</i> Flood situation analysis report
		 Travel Workshops Knowledge sharing platform 	 Flood adaptation guidelines Training material flood adaptation Lessons learned document
Output 2.1.4: Adaptive flood prevention practices promoted.	 Analysis of and experience with individual/communal practices to adapt to floods. 	 Target audience Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at local level. 	 Results Increase knowledge of optimal individual/communal practices to adapt to floods.
	 Analysis of and experience with agricultural and pastoralist practices to adapt to floods. 	 Disaster management authorities at local level. Communication means Meetings Workshops 	 Increased knowledge of optimal agricultural and pastoralist practices to adapt to floods. Knowledge products Flood response guidelines

		Knowledge sharing platform	Flood response runbookTraining material
Output 2.2.1: Drought risks analysed, and drought adaptation actions 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 adaptation practices, tools and technologies. 	 <i>Target audience</i> 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. <i>Communication means</i> Meetings Workshops Travel Interviews/surveys Knowledge sharing platform 	 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. 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: Enabling environment for drought adaptive activities created.	 Analysis of impact drought risks on agriculture and pastoralist value chain. Analysis of and experience with drought related insurance products. 	 Target audience 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. Insurance companies 	 <i>Results</i> Shared understanding of the impact of drought risks on the agriculture and pastoralist value chain. Increased knowledge of drought insurance products and applicability of interventions such as mobile barriers. <i>Knowledge products</i> Agriculture and pastoralist value chain assessment Drought risk insurance analysis

		 Meetings Travel Workshops Interviews/surveys Knowledge sharing platform 	
Output 2.2.3: Innovative water harnessing and irrigation structures established.	 Analysis of suitability of landscape/region to implement drought adaptation interventions. Analysis of and experience with drought adaptation interventions. 	 Target audience Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at local level. Disaster management authorities at local level. Communication means 	 <i>Results</i> Shared understanding of optimal landscape/region to enable drought adaptation interventions. Shared understanding of how to use drought adaptation interventions. <i>Knowledge products</i>
		 Meetings Travel Workshops Knowledge sharing platform 	 Drought situation analysis report Drought adaptation guidelines Training material drought adaptation Lessons learned document
Output 2.2.4: Adaptive drought prevention practices promoted.	Analysis of and experience with individual/communal practices to adapt to drought.	 Target audience Local communities (incl. farmers and pastoralists) Hydro/meteorological departments at local level. 	 Results Increase knowledge of optimal individual/communal practices to adapt to drought.
	 Analysis of and experience with agricultural and pastoralist practices to adapt to drought. 	 Disaster management authorities at local level. Communication means Meetings Workshops Knowledge sharing platform 	 Increased knowledge of optimal agricultural and pastoralist practices to adapt to drought. <i>Knowledge products</i> Drought response guidelines Drought response runbook Training material

Output 3 1 1: Flood and	Analysis of and experience Target a	dience Results	
Output 3.1.1: Flood and drought management plans (FDMPs) integrating climate change aspects and adaptation actions are developed.	 drought adaptation plans. Analysis of and experience with new flood and drought adaptation plans. Analysis of alignment flood and drought adaptation plans with (inter)national plans and policies. Meet Work Inter 	 Shared understanding on how to establish and improve flood and drought adaptation plans. Knowledge on processes and roles a responsibilities in flood and drought adaptation is enhanced. Knowledge on processes and roles a responsibilities in flood and drought adaptation is enhanced. Increased alignment of flood and drought adaptation with (inter)nationa plans and policies. 	al
Output 3.1.2: Adaptive capacity of institutions, farmers, and pastoralists in flood and drought management is improved.	 drought using innovative practices, tools and technologies. Analysis of and experience with innovative flood and drought adaptation practices, tools and technologies. Commune Meet Work 	 Shared understanding of how to increase capacities of people and institutions to adapt to floods and drought using innovative practices, tools and technologies. Increased knowledge of how to use innovative practices, tools and technologies to adapt to flood and drought. 	

Output 3.2.1:	 Analysis of and experience 	 Travel Interviews/surveys Knowledge sharing platform 	 Brochures/guidelines of the different practices, tools and technologies Training plans/documents Lessons learned documents Plan and policy alignment document
New/existing regional and national arrangements/networks for flood and drought management supported.	 with current arrangements/networks for flood and drought management. Analysis of and experience with current arrangements/networks for flood and drought management. 	 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. Communication means Forums Workshops Meetings Interviews/surveys Knowledge sharing platform 	 Shared understanding on how to establish and improve arrangements/networks for flood and drought management . Increased knowledge of roles and responsibilities in the flood and drought management. <i>Knowledge products</i> Multi-stakeholder arrangements/MoUs Flood and drought information sharing platform Flood and drought management plans Lessons learned documents
Output 4.1.1: 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. 	 Target audience 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. Communication means 	 <i>Results</i> Shared understanding on how to establish and improve sharing lessons on flood and drought management. <i>Knowledge products</i> Knowledge sharing guidelines Flood and drought information sharing platform Training plans/documents Lessons learned documents

		 Meetings Workshops Interviews/surveys Knowledge sharing platform 	
Output 4.1.2: Flood and drought information management strengthened.	 Analysis of and experience with current flood and drought information management activities. Analysis of and experience with new flood and drought information management activities 	 Target audience 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. Communication means Meetings Workshops Interviews/surveys Knowledge sharing platform 	 <i>Results</i> Shared understanding on how to establish and improve flood and drought information management. <i>Knowledge products</i> Knowledge sharing guidelines Monitoring and evaluation framework Flood and drought information sharing platform Training plans/documents Lessons learned documents

Table H.: Outcome scoring matrix mitigation measures

	F	elevanc	e	Eff	ectivene	ess		Sustai	nability		Effici	ency	Imp	oact		
	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