Country	**Burundi**
Request ID#	**AF-2021000014**
Title	Benchmark, select and deploy a low-cost, climate resilient, re-usable, easily replicable, scalable and mobile flood barrier to prevent damage from flooding and ensure water availability in times of drought in Rubira Hills, Musenyi area of Mpanda Commune in Bubanza, Burundi.
NDE	Institut Géographique du Burundi P.O Box 34, Gitega 33a, Bujumbura, Burundi. Mr Augustin Ngenzirabona, Director General Tel: +25779431955 Email: augungenzi@yahoo.fr
Proponent	Designated Authority Adaptation Fund Mr. Liévin Ndayizeye Counselor at the Director´s office of the Environment and Climate Change Ministry of Environment, Agriculture and Livestock Tel: +257.79.697.988 Email: ndayizeyelievin@yahoo.com

Summary of Climate Technology Centre and Network (CTCN) technical assistance

The objective of the project is to select and implement a low-cost, climate resilient, re-usable, easy replicable, scalable and mobile flood barrier to prevent damage from flooding and ensure water availability in times of drought in one pilot site of Rubira Hills, Musenyi area of Mpanda Commune in Bubanza, Burundi.

The Technical assistance will also i) map the regional, sub-national and national stakeholders, ii) elaborate a flood and drought assessment, iii) select the mobile flood barrier to be implemented in Rubira Hill in one pilot area, iv) implement the small pilot in the selected area and ensure capacity building of future users and beneficiaries of the technology, v) define a M&E framework, vi) formulate a roadmap (including financial consideration) for the scale up of the technology across Burundi.

Burundi is the 14th most vulnerable country and is the 17th least ready country–meaning that it is extremely vulnerable to, yet very unready to combat climate change effects. Climate adaptation requires changes in behaviour and appropriate technologies and measures to increase the resilience to floods and drought and provide protection to the main sectors such as agriculture, (critical) infrastructure, people and the environment where the risk of storm surge and flooding is imminent.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

National Designated Entity to the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism

Name: NGENZIRIBONA Augustin

Title: Director General of IGEBU

Date 09/04/2021

Signature:

Project Proponent (Signature is optional)

Name: NIKIZA Alexis

Title: Director General of APRN/BEPB

Date: 09/04/2021

Signature:

Climate Technology Centre and Network (CTCN)

Name: Rose Mwebaza

Title: Director of CTCN

Date: 12 April 2021

Signature:

1. Background and context

Burundi, a landlocked country in the middle of Central Africa covers an area of approximately 27,834 square km, is home to nearly 12 million inhabitants. Burundi has abundant natural resources, especially minerals and hydropower potential. Agriculture is its primary economic sector, employing 90% of its inhabitants. To realise its food security objectives, it must boost its agricultural productivity, which is the lowest in the region.

The visible and measurable effects of climate change across Burundi have became more apparent over the last two decades. There is a direct linkage between climate change effects on floods and droughts and food security and water availability. Nationwide, Burundi has alternatively experienced severe droughts, resulting in crop failure and a 35% livestock mortality (1998-2005) and severe floods, with similar effects (2006-2007). Such events have been estimated to result in a loss of 5-17% GDP per event.
As an example: There is an area in the Bubanza province where the Mutimbuzi and Mpanda rivers flow. In the same area there is ample agriculture where crops are being cultivated contributing significantly to the economy as well as food security. When water levels of the Mpanda river rise, this causes flooding of the Rubira hill in Musenyi area of Mpanda commune in the Bubanza province. This climate-induces flooding leads to significant damage to the production of food crops.

Projections for future changes in temperature due to climate change estimate an increase of 0.4°C per decade and a 1.9°C increase by 2050. Mean annual rainfall is projected to increase over Burundi by mid and late 21st century. Projections suggest the following:

- Most models project there will be a slight increase in days with 'heavy' rain.
- 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. These projections imply that climate change will cause Burundi to suffer from increased droughts and floods and therewith further threatening food security and water availability. Extreme floods and droughts are estimated to result in a yield decline of 5-25% in coming decades and reduce long-term growth by 2.4% of GDP per year.

Burundi is the 14th most vulnerable country and is the 17th least ready country–meaning that it is extremely vulnerable to, yet very unready to combat climate change effects Climate adaptation requires changes in behaviour and appropriate technical interventions that provide protection to main sectors of the economy, (critical) infrastructure, people and the environment where the risk of storm surge and flooding is imminent.

2. Problem statement

Barriers for strengthening the resilience
The population of Burundi belongs to the poorest segment in the region and does not have the capacity and the means to invest in infrastructural improvements for flood prevention, such as concrete dams. Nor do they have the capacity to respond adequately to flooding emergencies by constructing bridges in flooded areas. Within Burundi there is a lack of creation, sharing or appropriate use of data, information and knowledge for climate adaptation. Institutional and organisational barriers lead to unclear and unestablished roles and responsibilities when it comes to climate adaptation. Furthermore, agriculture, buildings and roads are not developed to be flood resilient. The (local) government does not have the capacity and resources to address the problems. The environmental degradation and the propensity for flooding in various areas has exacerbated the flooding situation.

How the technology will complement Burundi's adaptation efforts
The objective of this TA will be to benchmark, select and deploy a low-cost, climate resilient, re-usable, easily replicable, scalable and mobile flood barrier to prevent damage from flooding and ensure water availability in times of drought in Rubira Hills, Musenyi area of Mpanda Commune in Bubanza, Burundi.

This TA will empower Burundi to effectively adapt to climate change. The mobile flood barrier should enable effective flood prevention and water storage to ensure water availability in times of drought. The mobile flood barrier will be used to prevent damage to agriculture, infrastructure, the people and the environment caused by flooding. Water control will also contribute to an increase in agriculture production and therewith food security. The selected technology will need to be a straightforward product that is easy to operate and maintain. It should require little effort to hold capacity building sessions to ensure that the population has the right capabilities to enhance resilience against floods and drought using this technology. By implementing this technology, institutions should be enforced to establish governance structures aimed at enhancing resilience against climate change in the form of floods and droughts. The implementation of the technology should also lead to better use of weather forecasting data. The selected technology should be highly replicable and scalable.

The Technical Assistance will analyse the risk of floods and drought in Rubira Hills, identify existing mobile flood barriers, select the prototype to be implemented with main stakeholders, and implement a pilot project and its respective training so that the country will be able to use and maintain the technology by its own. The technical assistance will also define a roadmap to scale up the technology and define manual and step by step implementation guides.
Part of the project will also be to monitor and report on the (quantified) benefits of this technology.

Once the project will be completed successfully, the country of Burundi aims to scale up the implementation of the selected solution across the country to enhance resilience against climate change. The outcome of the project would enable the country to mobilize funds from international donors.

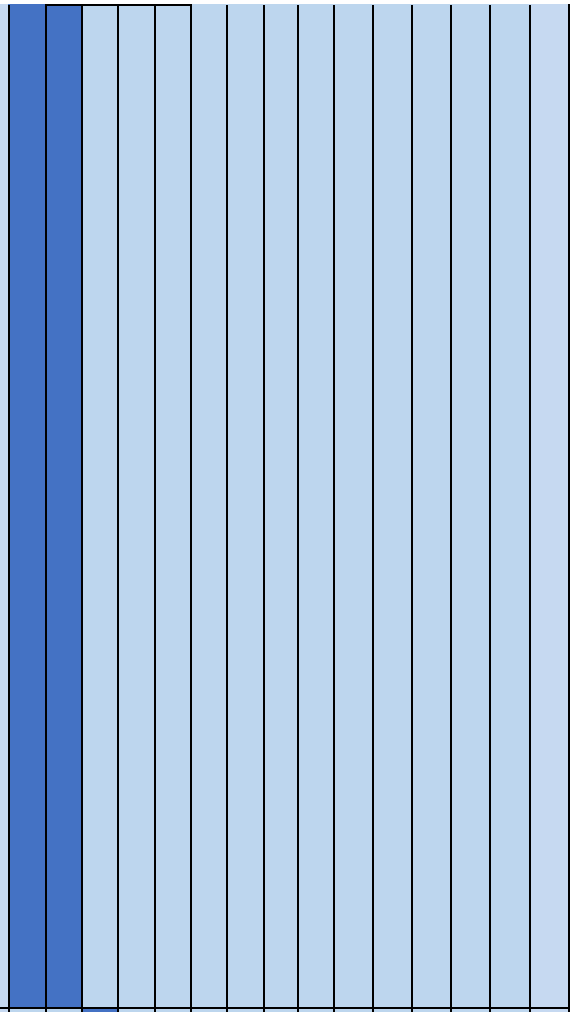
3. Logical Framework for the CTCN Technical Assistance:

***Goal**:* The objective of the project is to benchmark, select and deploy a low-cost, climate resilient, re-usable, easily replicable, scalable and mobile flood barrier to prevent damage from flooding and ensure water availability in times of drought in one pilot site of Rubira Hills, Musenyi area of Mpanda Commune in Bubanza, Burundi. Once the pilot will be implemented, the country expects to scale up the technology across the country, thus a clear scale up roadmap should be prepared so that respective funding could be mobilized.															
***Outcome**:* The Technical assistance will also: i) Map the regional, sub-national and national stakeholders, ii) Elaborate a flood and drought assessment of Rubira Hills iii) Select the mobile flood barrier to be implemented in Rubira Hill in one pilot area, iv) Implement the small pilot in the selected area and ensure capacity building of future users and beneficiaries of the technology, v) Define a M&E framework, *vi)* Formulate a roadmap for the scale up of the technology (including financial consideration) across the country.															
	Month[1]														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mandatory Output: Develop communication documents and implementation work plan															
Mandatory activities: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* **Activity i**: A detailed implementation plan for all activities, deliverables, outputs, deadlines and responsible persons/organizations, including a gender study and an itemized budget for implementing the Response Plan. The detailed implementation plan and budget must be based directly on this Response Plan. **Activity ii**: Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators should be developed to evaluate the timeliness and appropriateness of														

[1] The project timeline can be adjusted according to the level of development of the participating country.

implementation. The indicators selected in the monitoring and evaluation plan should be aligned with the Closure and Data Collection Report template. This will enable the implementer to complete the CTCN Closure and Data Collection Report at the end of the technical assistance (please refer to Activity 1.4 and Section 14 of the Response Plan). **Activity iii**: A two-page description of the expected impact of the CTCN technical assistance prepared at the start of the assistance, updated at the end of the technical assistance (a template will be provided). **Activity iv**: A CTCN Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).															
Mandatory Deliverables:															
i) Implementation plan	X														
ii) Monitoring and evaluation plan	X														
iii) Impact description document (initial and final version)	X														X
iv) Closure and Data Collection Report															X
Output 1: Stakeholder mapping and inception meeting.															
Activity 1.1: Map relevant stakeholders The activity will identify relevant stakeholders among governmental institutions at the local, regional, national and sub-national levels, food security and water availability sector professionals, academic institutions, and beneficiaries such as the Administrator of the commune, farmers and representant of the civil society, including youth and women protection associations. The identification of main stakeholders will be supported by the NDE and NDA and the Administrator of the commune of Rubira Hills. The final groups of relevant stakeholders will be presented in a report in which each actor will be linked to its sector of expertise, person of contact and contact details.															
Activity 1.2 Establishment of a restrictive working group With the support of the NDA/NDE, a limited number of persons will be selected to be part of a restrictive working group. The restrictive working group (max 8 persons) shall maintain a gender balance and an adequate representation from vulnerable groups. It will provide a technical overview and a high-level guidance at every stage of the selection and implementation of the selected mobile flood barrier. The restrictive working members should have the capacity to make sound decisions on some key aspects of the Technical assistance such as the selection of the mobile flood barrier to be deployed by the pilot implementation, and the prioritized site for the implementation.															

The role, responsibility, institutions, focal point as well as a work plan describing the meetings, workshops and activities to be managed by the restrictive working group will be presented in a report to ensure the availability of the group throughout of the implementation of the technical assistance.															
Activity 1.3: Conduct an inception meeting An inception meeting will be organised digitally to present the goals, milestones, expected results and anticipated deliverables and the role of the restrictive working group throughout the implementation of this Technical Assistance. The implementer, including the international and national experts, will be present as well as the NDA, NDE, and identified members of the restrictive working group.															
Deliverable:															
1.1 Stakeholder mapping report containing a complete stakeholder list.	x														
1.2 Constitution report on the establishment of the restrictive working group.	x														
1.3 Inception meeting report including list of participants, agenda, conclusions.	x														
Output 2: Flood /drought risk assessment															
Activity 2.1 Comprehensive assessment of flood risks / drought risks of the commune of Mpanda. Floods are amongst the most frequent and destructive type of disaster, causing significant damage and disrupting livelihoods throughout the world. Well-conducted flood hazard and risk assessments can provide valuable support for a range of decisions such as land-use master planning, design of infrastructure, and emergency response preparation. Proper estimation of risk is challenging and requires careful consideration of a number of factors, including watershed properties such as size, topography, and land use, the types and characteristics of storms that produce rainfall and flooding in the region, and the number, location, and types of buildings and other assets that could be damaged. This flood/drought risk assessment will provide clarifications on but not limited to: Risk Identification • The type(s) of floods that are most common and / or more destructive in the area (pluvial, urban, tidal or else). • Type of drought: meteorological – precipitation below average or hydrological drought with low river flows for example, environmental drought (combination of above). • Categorization of the floods/drought by their probability and intensity • Definition of hazard levels (1 to 5 for example) with different ranges of o For flood: inundation depths (m). The definition of the hazards could include a range of characteristics such as depth, velocity, volume, probability, duration, etc. o For drought: change in land use, change in land cover, water demand and use.															

• Demographics data of the commune and province. Risk analysis • Production of Flood/Drought Hazard Maps through satellite-based imagery • Classification of the zones by land use codes, categories (crop field, forest, wasteland for example) and definition of land use data (grassland, buildings, road and else). • Definition of the flood and drought vulnerability • Exposure analysis of economic assets and activities endangered by the flood and by the drought. • Adaptative capacity of the communes (is there any systems in place such as disaster prevention, early warning system, spatial planning for example?) and sensibility (ratio of population of young children below 15, of older people over 65, poverty level, female to male ratio etc) to flood as well as drought. • Define levels of future potential exposure and sensibility to floods and drought. • Generate climate risks maps with possible future exposure and sensibility to floods and drought. Risk Evaluation • Estimation of flood/drought risk level by district in Rubira Hill, Musenyi area, Mpanda commune, Bubanza province, Burundi. • Identification of a minimum of 1 and a maximum of 5 potential sites in Rubira Hills for the implementation of the pilot project based on the necessity (high exposure, high sensibility, low adaptative capacity). • Definition of the principal parameters that should be addressed to reduce the risk for each of the potential pilot sites identified. These elements are examples of the indicators that could be considered, but they will be adapted to the location and completed by the implementer and clearly described in a report. Based on the results of this analysis, a maximum of 5 potential pilot areas will be identified in Rubira Hills by the implementer for the implementation of the pilot project.	
Activity 2.2: Technology identification for flood barrier and storage facility Flood management practices can be defined as those that reduce challenges and those that enhance the individual and society ability to cope with a flood. In this activity, existing mobile flood barrier technology will be compared. Advantages and disadvantages of existing mobile flood barriers will be listed.	

A maximum of 5 different models of mobile flood barriers will be considered. For the purpose of this TA, the mobile flood barrier is expected to be made of material with very good elasticity (+ 350%) to be effective in all type of ground. It should be UV resistant and vapor tight. The barrier will have a lifespan of more than 30 years. The implementer will exclude all the technologies that will be impracticable or infeasible in Rubira Hills and will prioritized the technologies according to their capacity to adapt to Rubira Hills and to be scaled up across Burundi. For each of these prioritised technologies, a detailed description will be elaborated. This description will include but will not be limited to: - Name of the technology - Purpose of the technology - Photo of the technology - Technical requirements for a correct use of the technology: types of loads, water levels, limitation of leaking water, etc. - Estimated impact compared to the identified risks, exposure, sensibility. - Estimated cost - Lifetime duration As a result of this analysis, the implementer will present, in a matrix, the benefits of each technologies or measures and their applicability to the different sites identified as critical in activity 2.1. This matrix will be used during activity 3.1 to select the final technology or measure that will be deployed, and the identification of the site in which it should be implemented.																
Deliverable:																
2.1 Flood and Drought Risk Assessment and preliminary identification of sites for the pilot implementation		x														
2.2 Benchmarking of existing mobile flood barrier and prioritization of the most suitable model for Rubira Hill.			x													
Output 3: Planning for the implementation of the pilot project in Rubira Hills																

Activity 3.1 Selection of the technology and pilot area A meeting will be organized by the implementer and with the restrictive working group to select the model of mobile flood barrier to be deployed and identify the pilot area. It is planned that this meeting will be held physically, in Burundi, in prevision of activity 3.2 and 3.3. For the purpose of this TA, the mobile flood barrier is expected to be made of EPDM (synthetic rubber), with very good elasticity (+ 350%) to be effective in all type of ground. It should be UV resistant and vapor tight. It is requested that the barrier will have a lifespan of more than 30 years. The mobile flood barrier should be 100% recyclable.														
Activity 3.2 Site visit to the pilot area The team of experts will visit the pilot area. This visit on site will be focused on collecting all technical data requested to draft the implementation plan of the pilot project. The team of experts will collect all on ground data necessary to plan and design the deployment of the pilot project. The relevant members of the restrictive group will support the work of the team of experts and do their best to support the implementer during this on the ground activity.														
Activity 3.3 Stakeholders workshop The implementer will organize a stakeholder's meetings in which all the stakeholders mapped in the activity 2.1 will be invited. The objective of this public event will be to present the result of the flood and drought assessment, and explain the role of the mobile flood barrier, its purpose, functionalities, expected positive impacts. The day and time of the event will be chosen to ensure the wider participation of the citizens of the Rubira Hills. Invitations will be sent at least 2 weeks in advance and will be published in diverse channels to spread the message efficiently. A particular focus will be made to ensure the participation of women and youth as well as other vulnerable groups. The implementer will develop clear presentations, using simple explanations and avoiding technical specificities to communicate with the citizens and will ensure enough time is available to answer questions and clarify doubts.														
Activity 3.4: Detailed implementation plan of the pilot project The implementer will prepare a detailed implementation plan for the deployment of the pilot. This report will provide in a clear, complete and precise manner all the specificities of the pilot implementation, included but not limited to the technical, human, financial requirements for the implementation of the pilot project in the selected area.														

This may include but will not be limited to: - Number of people required to deploy the technology - Time required to deploy and taking down the technology - Composition elements of the technology (measurements, length, weight, tube diameter, fittings, filling connections, water drains characteristics, material) - Determination of where the flood waters should be running to, considering that the objective of the country is to store the water to use it during drought period. - Selection of a storage place - Basic implementation guide. - Necessary equipment (including a maintenance guide) - Conditions of use (Max, minimum of flood water) - Logistics: work plan, time for the technology to be imported, how would it be routed, if any visa or specifics national authorization will be requested, person in charge of the transportation up to Rubira Hills, person in charge of unloading the technology, etc.															
Activity 3.5 Organization of a meeting to discuss the logistics and implementation of the pilot Following the elaboration of the detailed implementation plan, the implementer will set up a virtual meeting with the restrictive working group to present the detail of the deployment of the pilot, including the expected timeline and persons in charge of the different steps to be followed to ensure the success of the operation. The implementer will review the work plan based on the relevant comments received and will send back a final version of the implementation plan.															
Deliverable:																
3.1 Report of the meeting with the final selection of the mobile flood barrier to be deployed and identification of the pilot area				x												
3.2 Report on the visit on site to the pilot area with pictures, participants, conclusions				x												
3.3 Report of the stakeholder workshop including the detail of how the participants were invited, and how the participation of vulnerable groups was encouraged, list of participants disaggregated by gender, photos, PowerPoint presentations, questions asked etc.				x												
3.4 Detailed implementation Plan					x											
3.5 (i) Report on the meeting to discuss the logistics and implementation of the pilot (ii) Final implementation plan including modifications requested by the restrictive working group.					x											

Output 4: Deployment of the mobile flood barrier in the pilot area																
Activity 4.1: The technology is routed to the selected area The implementation plan will be deployed, and the selected technology will be routed to the pilot area. The team leader as well as technical team of experts will be present for the reception of the material. During this activity, the implementer along with the restrictive working group will work on collecting all administrative documents (visa for example) and will coordinate the transportation of the selected technology to the pilot area in Rubira Hills.																
Activity 4.2 Detailed manual on the use and maintenance of the technology This manual should include all relevant and exhaustive information that the country needs to have for a correct and effective use and maintenance of the mobile flood barrier. This includes but is not limited to: - clear indications on when, what and how the methodology should be stored, revised, when material should be replaced, where should equipment be purchased, estimated price, estimated time for delivery, conditions of the guarantee for the equipment and its component, and every detail that will be needed by the country to make an efficient use of the technology. - Also, a video for the installation of the technology will be developed and uploaded in a secure and accessible platform (to be defined with restrictive working group). - A training guide will be included describing all the steps of the training to be followed by any new users. - This manual will also include a step-by-step description of the deployment of the technology (the information defined for the activity 3.4 will be relevant and can be used). - As well as any other relevant information that should be shared with the country. This manual will be translated into French, English and up to 3 more local languages according to the instructions of the restrictive working group and considering a possible scale up of the project to other provinces of the country.																
Activity 4.3: Deployment of the technology by professionals In presence of the team leader and technical team of experts, the mobile flood barrier will be installed in the pilot area. The implementer will solve any issues or problems that could make the technology difficult to use, or that could lower the efficiency of the technology. Once this test will be finalised, and a fully successful use of the mobile flood barrier is ensured, the technology will be taken down and stored.																

Activity 4.4: Learn by doing workshop The implementer will replicate the installation of the mobile flood barrier in presence of the future users and entity responsible for the use and maintenance of the technology. This workshop needs to be practical and should enable future users of the technology to practice, touch, experiment, and share any questions they could have with regards to the technology. A full day will be planned for this demonstration, and the exercise could be repeated many times. The objective is to ensure that the country is capacitated to use the mobile flood barrier, and will be able to deploy it alone, whenever requested and without the presence of the implementer or any other third parties. Part of this training will also describe the maintenance required by the technology. **All users will be trained not only on the deployment but also on the maintenance of the technology.** A list of persons trained will be made, and provided to the NDA, and NDE. Once the Technical Assistance will be finalized, the country will be held responsible to train the users of the technology on its use and maintenance on a regular basis.															
Activity 4.5: Stakeholder's consultation to introduce the mobile flood barrier to Rubina Hills citizens A stakeholder consultation meeting will be organized to present the mobile flood barrier to the citizens of Rubira Hills. The implementer will explain to the citizens how the technology works, what are the expected impact of the technology, who will be in charge of deploying it and when should it be deployed. The implementer will answer any questions from the citizens. Invitations to this stakeholder consultation will be sent at least 10 days before the event and will be posted through different channels to ensure youth, women, farmers, and all citizens of the Rubira Hills are informed.															
Deliverable:															
4.1 Report with pictures demonstrating that the technology has been routed to the pilot area.							x								
4.2 Detailed manual on the use and maintenance of the technology								x							
4.3 Report on the deployment of the technology by professionals with pictures								x							
4.4 Report of the "learn by doing workshop" including the list of participants and persons trained, pictures, explanations given, main questions asked.								x							
4.5 Report on the stakeholder´s consultation workshop including the detail of how the participants were invited, and how the participation of vulnerable groups was encouraged, list of participants disaggregated by gender, photos, power point presentations, questions asked etc.								x							
Output 5: Definition of a Monitoring and Evaluation Framework															

Activity 5.1: Definition of a Monitoring and Evaluation Framework.
The implementer will design a list of quantitative and qualitative indicators in order to measure the impact of the technology installed with regards to the risks and impacts of flooding and drought in Rubira Hills.

The list of indicators should include at least:

- Indicators of risk (exposure and sensibility): this could include the number of properties (houses and businesses) in areas of flood risk, annual rate of development (houses and businesses) in areas of flood, charge in hard surfacing (areas of impermeable surfaces), vulnerable populations at flood / drought risk.
- Indicators of action such as provision of flood defences, management of surface water in built-up areas, provision of early warning systems, number of users trained to the technology per year, number of maintenance controls per year, for example
- Indicators of impacts: which could include flood/drought damages, death and injuries.

The system will also consider Climate parameters:

- Change in annual temperature
- Mean monthly temperature
- Change in annual precipitation
- Monthly precipitation
- Extreme precipitation events
- Decrease in rainfall
- Increase in temperature
- Increase in evapotranspiration
- Etc.

And some indicators about climate actions to prepare the country to a more complex flood and drought strategy such as:

- Number of climate responsive tools developed and tested
- Number of public awareness campaigns on water efficiency
- Percentage of the population with access to rainfall forecast
- Number of government staff that has been trained on climate change adaptation
- Number of policies and coordination mechanisms explicitly addressing climate change
- Uptake of early warning systems
- Number of properties with retrofitted flood resilience measures, water meters, water efficiency measures, etc.

- Number of people supported to cope with the effects of climate change through the availability of the service or facility - Etc These indicators are only examples and should be defined by the implementer. For each of the indicators, a small description will be provided including at least but not limited to: - The sectors to be considered by the indicator. For example, the indicator "Change in annual temperature "will have impact on agriculture, biodiversity, human health, water resources etc. - The focus of the indicator: For "Change in annual temperature ", this will be "Climate parameters". - The Unit of measurement - Adaptation relevance - Potential limitations: for ""Change in annual temperature "a minimum of historic climatic data is required for example. - Data needs - Data source - Spatial scale (national, sub national) - Disaggregation: by commune or province for example. The result of this activity will be a draft of M&E framework.															
Activity 5.2: Presentation of the M&E framework to the restrictive working group A virtual meeting will be organized by the implementer to present the indicators for the M&E system that have been defined in the deliverable 5.1. The implementer will explain the indicators, how they should be monitored, and answer any questions from the restrictive working group. At the end of this meeting, the report 5.1 will be shared with the restrictive working group to be revised.															
Activity 5.3. Revision of the M&E report by the restrictive working group Three (3) rounds of revision will be considered to improve, correct, adjust the proposed M&E indicators. At the end of this sub activity, a final M&E report will be delivered.															

Activity 5.4: Creation of an excel database to facilitate the M&E system A M&E system is dependent on data availability. It should be easy to update, accessible to different stakeholders (that will monitor different indicators), transparent, and should enable short-, medium- and long-term follow-up. The implementer will deliver an excel database with a good interface that will make it easy to be updated by different stakeholders. The excel will need to be friendly, and its use should be explained clearly in a methodology that will be defined in the first sheet. The excel will be unlocked.															
Deliverable:															
5.1 Draft M&E Report								x							
5.2 Report of the meeting to present the M&E Report								x							
5.3 Final M&E report describing and defining each indicator									x						
5.4 Editable M&E in excel format										x					
Output 6: Elaboration of a roadmap to scale up the pilot technology															
Activity 6.1: Step-by- step roadmap to scale up the implementation of the mobile flood technology across Burundi The implementer will define in a report the main recommendations that should be considered to scale up the mobile flood barrier across Burundi. This roadmap should enable the country to mobilize funding in order to scale up the technology across the country. The roadmap should be designed in a clear and concise way. It should enable the country to decide whether the mobile flood barrier could be used at other locations or not. It should include but should not be limited to: - a checking list of criteria to be checked before implementing the technology to a new site. - The roadmap should focus on the transportation, the technical requirements for an efficient use of the technology, security aspects will be considered, required storage, technical specificities, and any other aspects relevant to this technology and its use. - This roadmap should also analyse additional technologies that could be used as a complement to the deployed one. For example, if the technology deployed is a mobile flood barrier, the implementation of an early warning system could be complementary and generate a prediction and protection against the flood / resilience against drought. - This report will include a chapter on financial mechanisms that could be used for the acquisition of the technology, a methodology to be applied to prioritize next territories that should benefit from															

the technology, a list of data which should be available to define the needs and efficiency of the deployed technology. This roadmap will be shared with the restrictive working group and reviewed (3 rounds) before editing the final version of the scale up roadmap.															
Activity 6.2: Meeting to present and explain the scale up roadmap The implementer will organize an online meeting to present, explain and discuss the roadmap defined to enable the scale up of the mobile flood technology across the country. Afterwards the document will be shared with the restrictive working group for their revision and comments (3 rounds)															
Activity 6.3 Final roadmap. The implementer will incorporate the comments and elaborate the final version of the roadmap.															
Deliverable:															
6.1 Step-by-step draft roadmap to scale up the implementation of the technology across the country.												x			
6.2 Report of the meeting to present and discuss the scale up roadmap													x		
6.3 Final scale up roadmap.															x

4 Resources required and itemized budget:

Provide an indicative summary of the necessary resources and detailed budget required to implement the technical assistance of the CTCN, including monitoring and evaluation activities, with the help of the following table. It is important to note that a minimum of 1 per cent of the budget must be explicitly aimed at gender-specific activities related to technical assistance (see Section 10 for more information on gender). Once the response plan is completed, the Climate Technology Centre (CTC) will select the implementers responsible for implementing the response. *The CTCN and the chosen lead implementer will need to agree on a detailed activity-based budget.*

Activities and Outputs	**Input: Human resources** *(Title, role, estimated number of days)*	**Input: Travel** *(Purpose, national vs. international, number of days)*	**Inputs: Meetings and events** *(Meeting title, number of participants, number of days)*	**Input: Equipment and resources** *(Item, purpose, buy/rent, quantity)*	**Estimated cost (US $)** *Please indicate the cumulative cost of the activities and outputs and provide an estimated cost range for each activity and the entire Response Plan.*	
					Minimum	**Maximum**
Mandatory Output: Development of the work plan and related communication documents	*Project manager, project lead, 10 days*		*Project closure meeting, 10 members for 1 day*		***8,000***	***10,000***
Output 1: Stakeholder mapping and inception meeting.	*Project manager, Project Lead and State / Federal representative, Consultant and Gender Expert, Women's Interest representatives*		*Inception meeting, 10 members for 1 day*		***20,000***	***23,000***

	and Communication Expert, Consultant combined 22 days					
Output 2: Flood /drought risk assessment	*Hydrologists (team), Consultant and Mobile Flood Barrier Specialist, Consultant, combined 30 days*		*Synthesis workshop (demonstrating the outcome of the data analyses), 10 members for 1 day*		*32,000*	*35,000*
Output 3: Planning for the implementation of the pilot project in Rubira Hills	*Hydrologists (team), Consultant and Gender Expert, Consultant and Mobile Flood Barrier Specialist, Consultant and Project Manager, Project Lead and State / Federal representative,*	*International flights of 3 experts for the duration of 5 days each for field visits and local meetings and workshops*	*Stakeholder workshops, 15 members (Including Women's representative) 2 days* *Meeting to discuss the logistics and implementation, 10 members 1 day*		***45,000***	***50,000***

	Consultant, combined, 35 days					
Output 4: Deployment of the mobile flood barrier in the pilot area	*Mobile Flood Barrier Technician, Certified Trainer and Project Manager, Project Lead, combined 27 days*	*International flights of 2 certified trainers to provide a demonstration and training sessions for 3 days*	*Training session, 15 members for 2 days Stakeholder´s consultation workshop, 15 members 1 day*	*Renting / leasing of 500 meters worth of mobile flood barrier until demonstration has been done during a real-life threat of flooding*	*60,000*	*62,000*
Output 5: Definition of a Monitoring and Evaluation Framework	*Project manager, project lead (incl. project support), 27 days*		*Presentation of the M&E framework, 5 members for 1 day*		*30,000*	*32,000*
Output 6: Elaboration of a roadmap to scale up the pilot technology	*Project manager, project lead and State / Federal representative, Women's Representative and Communication Expert, Consultant and*	*Two international flights for mobile flood barrier specialist and hydrology software expert*	*Meeting to discuss scale up, 8 members (Including Women's representative) for 2 days*		*35,000*	*38,000*

	Hydrologist, Consultant flood risk analysis and Mobile Flood Barrier Specialist, combined 35 days					
Estimated cost range for the entire Response Plan (US$)					***230,000***	***250,000***

5 Profile and experience of experts

Experts required	Brief description of required profile
International experts	
Team leader and expert in flood/drought prevention (I1)	- Team Leader and expert in flood/drought prevention. - Master or above in flood prevention, water management, climate change adaptation, or affiliate. - At least 10 years of experience in defining and developing climate adaptation strategies to prevent floods and drought. - At least 5 references demonstrating experience in the identification of climate adaptation technologies and implementation in developing countries. - Experience in capacity building, organizing workshops and capacity building - Experience in managing complex projects in the presence of various stakeholders. - Fluency in French and English is compulsory.
Expert in climate adaptation flood technologies (I2)	- Master or above in Climate Change, water management, flood prevention, climate change adaptation technologies, or affiliate - Minimum of 10 years' experience in climate adaptation technologies and flood strategies. - At least 5 references in designing flood assessments, flood strategies, implementation of technologies to prevent floods. - Experience in capacity building. - Fluency in French and English is mandatory - Expert I2 and I3 could be the same expert
Expert in climate adaptation drought technologies (I3)	- Master or above in Climate Change, drought prevention climate change adaptation technologies, or affiliate - Minimum of 10 years' experience in climate adaptation technologies and drought strategies. - At least 5 references in designing drought assessments, drought strategies, implementation of technologies to prevent droughts. - Experience in capacity building. - Fluency in French and English is mandatory - Expert I2 and I3 could be the same expert
Mobile flood barrier expert (I3)	- Civil engineer, master or above in water management, flood prevention, climate adaptation technologies - Minimum of 8 years' experience in deploying mobile flood barriers in developing countries - At least 5 references in the installation of mobile flood barriers in developing countries. - Fluency in French and English will be a plus.
National experts	
Water expert (N1)	- Master or above in water management, flood/drought prevention, water use management or affiliate - Minimum 8 years' experience in water management in Burundi or in the East Africa.

	- At least 5 experience in water management in Burundi. - Fluency in French is a must. - Presence in Burundi desired or availability to travel frequently and for long periods.
Gender expert (N2)	- Sociologist, anthropologist, gender management graduate or affiliate. - Minimum 8 years of experience in carrying out socio-economic surveys. - Gender experience in the context of water management, food security, climate change adaptation and mitigation, - At least 5 references in Africa. - Presence in Burundi desired or availability to travel frequently and for long periods. - Fluency in French is mandatory
Communication expert (N3)	- Journalist, master or above in communication, or affiliate - Minimum 8 years of experience in developing communication documents, capacity building presentations about sustainability or environment, or climate change, food security or affiliate - At least 5 references of trainings, workshops, capacity building on environment, sustainability, climate change, water, drought, food security or similar in Burundi. - Presence in Burundi desired or availability to travel frequently and for long periods. - Fluency in French is mandatory

6 Intended contribution to the expected impact of the technical assistance

As result of the project, the Mpanda commune will enhance its resilience to climate induced flooding and drought. It is anticipated that the community will benefit in terms of better health, security, food security, transportation and employment creation which form the base for poverty alleviation in terms of shared prosperity and financial stability.

Women and youth will benefit most, because their safety and access to health care, education and economic activities is severely impacted most by flooding and drought. The project will help to improve the capacity and livelihood of the local women through trainings.

7 Relevance to NDCs and other national priorities

Burundi has prepared two National Communications for the UNFCCC and a National Action Plan for Adaptation (NAPA). In the NAPA (2007), priority areas are amongst others:

- control the river dynamics of watercourses and torrents in Mumirwa;
- popularise rainwater harvesting techniques for agricultural or domestic use; and
- establish buffer zones in Lake Tanganyika floodplain and around the lakes of Bugesera;

As part of their National Climate Change Strategy and Action Plan, Burundi has identified the following priorities:
- 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

Burundi's NDC proposes to prioritise actions that reflect the priorities identified in its National Strategy and Action Plan on Climate Change:
- Integrated management of climate risk and forecasts over time so as to be able to act in advance
- Protection of aquatic and land-based ecosystems
- Coaching of the population to develop their resilience to climate change

The selected technology should contribute to multiple national priorities. It should support disaster risk reduction by preventing damage caused by flooding; therewith protecting ecosystems. The population will be trained on how to enhance their resilience against climate change by using this technology. The usage of this technology will be embedded in disaster risk reduction policies and governance structure; this helps institutions in combating climate change.

The deployment of the technology will be part of the emergency activities to ensure action is taken in advance. It will also be used to harvest and store water for times when there is drought; this ensures water availability for agriculture or domestic use.

Some relevant documents are:

- Burundi's Nationally Determined Contribution (NDC)
- Burundi's Technology Needs Assessment
- Burundi's Adaptation Plans

8 Links to relevant parallel activities:

The relatively limited amount of climate change projects in Burundi can be explained at least in part by its recent period of conflict – which encourages other priorities. Climate change projects with a link to water and/or food security that are implemented in the country (either bilaterally or through international climate funds) include:

Name of Project	Fund	Amount of Funding Approved (USD millions)	Disbursed (USD millions)	Dates
Promotion of Small Hydro Power (SHP) for Productive Use and Energy Services	Global Environment Facility (GEF)	1,6		2015
Restructuring of the Value Chain Development Programme (PRODEFI)	Adaptation for Smallholder Agriculture Programme (ASAP)	5	0.8	2015
Community Disaster Risk Management in Burundi	Least Developed Countries Fund (LDCF)	8,8	8,8	2012
Infrastructure resilience emergency project	World Bank	25		2015
BI-Jiji and Mulembwe Hydropower	World Bank	100		2014
Sustainable Coffee Landscape project	World Bank	4,2		2013

9 Anticipated follow-up activities after this technical assistance are completed:

Once the technical assistance will be finalized, the country expects to scale up the technology across the country.

10 Benefits in terms of gender and co-benefits:

Imbedded into the design of the activities:	The positive impacts for women and youth will be monitored through the monitoring methodology included in the MRV-plan. The benefits will be monitored following a logical framework through indicators such as: • Number and percentage of women and men who attend capacity building workshops • Number of men and women in decision making and or leadership positions in this project and in the climate adaptation governance structure • Number and percentage of men and women in climate technology user groups, cooperatives, committees, utilities etc. • Number of women and men that directly benefits from the implementation of this technology in terms of safety and food security

Gender and co-benefits of the activities:	Women and youth will benefit most, because their safety and access to health care, education and economic activities is severely impacted most by flooding and drought. The project will help to improve the capacity and livelihood of the local women through trainings.

11 Main national stakeholders in the implementation of the technical assistance activities:

Stakeholders	Role to support the implementation of the micro-grants project
National Designated Entity	To evaluate and approve the technical design, the methodology and later to verify of the adaptation benefits
Designated Authority	To evaluate and approve the technical design, the methodology and later to verify of the adaptation benefits
Applicant	Senior User: Specify requirements of the outcome of the demonstration project
Flood Response Team	Senior Executive: Ultimately responsible for a successful outcome of the project and he has significant decision power – supported by the senior supplier and senior user
Local Community Representatives	Representing the interest of the local community and approve the design of the solution and evaluate the adaptation benefits
Youth and gender representative	Representing women's and youth's rights that will impacted by the project
Deltares (Applied Science Institute)	Determining flood risk profile and anticipating requirements

Contribution to the SDGs:

Goal:	Sustainable Development Goal	Direct contribution from CTCN TA
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	The TA should reduce the impact of flood and drought in the agriculture sector.
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
5	Achieve gender equality and empower all women and girls	
6	Ensure availability and sustainable management of water and sanitation for all	The TA is about flood and drought assessment, adaptation technologies to floods and drought, implementation of a pilot and design

		of roadmaps to scale up the mobile flood barrier across the country.
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	
	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	The TA will be implemented in Rubira and will make the commune more resilient, safe, and inclusive.
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	The TA will protect Rubira Hills, Mpanda Commune in Burundi from floods and drought and increase the resilience of the country to floods and droughts.
	13.2 - Integrate climate change measures into national policies, strategies and planning	A flood and drought assessment, M&E framework and systems, as well as benchmarking of existing mobile flood barrier will be made.
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Capacity building to the users of the technology and citizens of Rubira Hills will be ensured.
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a	

	goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	The flood and drought assessment are climate change related planning and management that will benefit Burundi, an LDC.
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

12 Classification of technical assistance:

Please tick the relevant boxes below	Primary	Secondary
☐ 1. Decision-making tools and/or information provision		
☐ 2. Sectoral road maps and strategies		X
☐ 3. Recommendations for legal reforms, policies and regulations		
☐ 4. Financing facilitation		
☐ 5. Private sector engagement and market creation		X
☐ 6. Research and development of new technologies	X	
☐ 7. Feasibility of technology options	X	
☐ 8. Piloting and deployment of technologies in local conditions	X	
☐ 9. Technology identification and prioritization	X	

Please note that all CTCN technical assistance contributes to strengthening the capacity of in-country actors.

13 Monitoring and evaluation process

Upon contracting the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. This monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) THE COUNTRY on overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer on the experience and knowledge gained through the technical assistance; and (iii) the CTCN Director on the timeliness and appropriateness of the activities and outputs.

Abbreviations and acronyms

CFC	Climate Finance Centre
CIS	Commonwealth of Independent States
CTCN	Climate Technology Centre and Network
EBRD	European Bank for Reconstruction and Development
EU	European Union
GCF	Green Climate Fund
GHG	Greenhouse Gases
HVAC	Heating, Ventilation and Air Conditioning
NDA	National Designated Authority
NDC	Nationally Determined Contribution
NDE	National Designated Entity
SNiP	Construction Norms and Regulations of the Soviet Union
TA	Technical Assistance