International Organization for Migration (IOM)
The UN Migration Agency

ANNEX – B

Terms of Reference

Multi-Hazard Assessment and Risk Mapping in Burundi

1. INTRODUCTION

Disasters caused by natural hazards are the main cause of displacement in Burundi and account for 79% of all internal displacement in the country (DTM, Dec 2019). IOM is committed to working with communities to prevent and mitigate the risk of disasters and displacement and strengthen capacity for response when displacement is unavoidable. IOM, through a three-year European Union-funded project on Disaster Risk Reduction (DRR), will support a multi-hazard assessment and risk mapping initiative targeting all 18 provinces and 35-50 especially vulnerable communes in the country. The purpose of the assessment is to map major hazards in Burundi – specifically **torrential rains, flooding, earthquakes, violent winds, and landslides** – that affect the lives, properties, available services, livelihoods and the environment of communities, and that impact on population movements, including displacement. The result of the assessment and mapping will be used by government and other stakeholders at national and sub-national levels to support planning, decision-making and prioritization of DRM investments and activities. Importantly, the risk assessment findings and recommendations will also be used to:

- Update and/or formulate Contingency Plans at provincial and communal levels;
- Improve DRM coordination across sectors at regional, inter-regional and communal levels;
- Strengthen the integration disaster risk considerations in national and local development planning and policy;
- Inform the design and prioritization of simulation exercises;
- Promote the establishment of Community Emergency Response Teams (CERTs);
- Inform prioritization of structural and non-structural DRM investments at the community-level.

As such, potential for subsequent use, updating and operationalization of the outputs of the risk assessment will be key to ensuring sustainability and transfer of knowledge to relevant national authorities and stakeholders. The hazard assessment and mapping will be awarded to a Consultant Firm / Service Provider with expertise and experience in disaster risk management and the implementation of multi-hazard risk assessments. The Consultant Firm / Service Provider will be expected to carry out the assignment in close coordination with IOM, as well as with government counterparts, experts and local partners.

2. CONTEXT

In the socio-environmental context, Burundi is regularly affected by a variety of natural hazards, notably linked to violent hydro-meteorological events (stormy winds and torrential rains, landslides and flooding of valleys and plains along Lake Tanganyika). The country is also facing climatic events with slower effects, such as drought and soil degradation and erosion, but which pose a threat to the long-term viability of livelihoods and the general well-being of the population. In addition, the impacts of climate change are

increasingly felt across the country. Annual precipitation is decreasing, the long rainy season is ending earlier, the short rainy season begins later and, therefore, the long dry season is becoming longer. Rainfall during the rainy season is becoming more intense and frequent, and average temperatures are rising. Climate model scenarios indicate that these trends will continue over the coming decades, suggesting more frequent and intense droughts and hydro-meteorological hazards. The combined impacts of various hazards are felt in increasingly significant ways by the Burundian population who are particularly vulnerable given widespread poverty and unemployment, and dependence on a subsistence agriculture.

Using its displacement tracking methodology, the International Organization for Migration (IOM) has collected data on the impacts of hazards throughout the country. The data reveals that between October 2018 and June 2019, 207 disasters (mainly associated with storms, torrential rains and stormy winds) affected more than 20,000 people in Burundi, and destroyed or damaged some 4,000 houses, 89 schools, four health posts and three bridges. Drinking water supply infrastructure and other basic services where impacted too. These events led to the displacement of 17,185 people, which also impacted already vulnerable host communities. Currently, there are at least 103,000 displaced persons in the country, mainly as a result of natural hazards. It is obvious that natural hazards have significant and lasting repercussions for the populations directly affected but is also impacting on overall socio-economic development of the country.

Mapping and measuring disaster risk constitute a critical input to effective disaster risk management. This multi-hazard risk assessment will generate the information necessary for prioritizing actions in emergency preparedness and response planning as well as in community-based prevention and mitigation. It will also contribute to creating a knowledge base for risk-informing development strategies so that future development investments increase the capacity of populations to withstand existing and future disaster risk.

3. OBJECTIVE

The overall objective of the assignment is to undertake a nation-wide mapping of major hazards and risks – specifically related to torrential rains, flooding, earthquakes, violent winds, landslides – that affect the lives, properties, available services, livelihoods and the environment of communities in Burundi, and to develop prioritized recommendations for integrating disaster risk findings in national DRR and preparedness planning efforts.

Specifically, the assignment will include the identification hazards; a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability, including the physical, social, health, environmental and economic dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities with respect to likely risk scenarios.

4. SCOPE OF SERVICES

The scope of the assignment is to establish a methodology for analyzing hazards and risks in all 18 provinces in Burundi and in 35-50 most at-risk communes. The methodology will be used to identify the principal hazards that affect the country and the extent of exposure and vulnerability in the case of each hazard. This will include incorporating satellite imagery, aerial photographs, GIS and other IT methods to express the data. The assessment will produce a risk atlas with nation-wide coverage and provide the necessary information and recommendations for integrating data and maps into disaster risk management policies and programmes, as well as in any existing disaster risk information systems. The assignment will be undertaken in close consultation with relevant counterparts, experts and stakeholders. The methodology will require the collection and analysis of available secondary data, including official

statistics, assessment reports, technical data sets and historical data. It will also entail the collection of primary data through site visits, key informant interviews and focus group discussions. More specifically, the risk analysis will require carrying out a detailed analysis of each of the key dimensions of risk, namely hazards, exposure, vulnerability and capacity:

4.1 Hazard analysis

An analysis of hazards will be undertaken to develop a comprehensive natural hazard profile and produce hazard maps covering all regions of Burundi, and specifically focused on torrential rains, flooding, earthquakes, violent winds, and landslides. The hazard maps will include information about hazard intensity or magnitude, frequency and probability. The analysis will include identifying plausible event scenarios including possible situations of displacement. If available, historical data will be used to model future events and cycles of recurrence and frequency. The service provider is expected to integrate the multi-hazard mapping results into an appropriate, accessible, user-friendly and updatable database, which can form the basis for the creation of a disaster management information system. The assignment will include the integration of hazard data, models and maps in proper GIS formats and the delivery to IOM of data sets, maps and reports in formats customized for the stakeholders. All maps should be presented following the national cartography parameters and be compliant with the official projection system.

4.2 Exposure analysis

This element will measure to what extent people, infrastructure, housing, production capacities and other tangible human assets are located in hazard-prone areas across the country. This will include undertaking a provincial physical inventory of geography, population, economy, agriculture, livelihoods, infrastructure. Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.

4.3 Vulnerability and capacity analysis

The third element of the risk assessment is the vulnerability and capacity assessment. The assessment will identify vulnerable elements in each geographical area – physical, social and economic. Physical components include public and private buildings and critical facilities such as power stations telecommunications links, WASH installations and health/nutrition infrastructure. Social components include identifying vulnerable population categories such as the elderly and the physically handicapped; children and single parent families, displaced groups, as well as people living in remote areas and the poor or those whose livelihoods are vulnerable. Economic vulnerability will be mapped in terms of the level of exposure of economic assets and processes to specific hazards. The assessment will also need to consider community understandings of risk and evaluate the effectiveness of existing coping capacities.

5. DELIVERABLES

The following deliverables are expected from the assignment:

5.1 A methodology for assessing risk based on an analysis of hazards, exposure, vulnerability and capacity

5.2 A preparation workshop with IOM and key stakeholders to confirm parameters, methodology, expectations, geographical coverage and deliverables.

5.3 An inception report after one month presenting a detailed work plan

5.4 A synthesis report on Multi-Hazard Assessment and Risk Mapping in Burundi, covering the following:

- A non-technical executive summary;
- Overall descriptions of the 18 provinces and 35-50 most vulnerable communes - geography, population, economy, agriculture, trade, people's livelihoods, infrastructure and environment;
- Description of community vulnerability, vulnerable groups and the drivers of vulnerability, existing knowledge and coping systems;
- A comprehensive well-structured profile of each hazard, highlighting hazard prone areas, characteristics of hazards, plausible hazard intensity maps, and possible trends in the context of climate change, etc;
- Technical recommendations for transfer of knowledge and data to local stakeholders and for ensuring continuing hazard assessments;
- Detailed explanation of the hazard assessment and mapping methodology for each hazard;

5.5 Detailed technical report on the process, calculations and models used for development of the hazard scenarios, as well as for the hazard prone areas identification and zoning;

5.6 A set of digital hazard datasets in GIS formats;

5.7 Hazard zoning and hazard intensity maps in digital and analog format (five (5) national maps, 90 provincial maps and five (5) vulnerable area maps); maps should be geo-referenced in accordance with official national and international patterns and norms;

5.8 A well-structured documentation of all the methodologies used in the study;

5.9 A training for DRR decision-makers in government to ensure knowledge and skills transfer about risk assessments (how to interpret and make use of results in DRM planning and decision-making).

5.10 A project workshop to explain methodologies and disseminate key findings before the final version of the report and associated deliverables are handed over; this would also include evaluating and prioritizing the risks identified in the assessment;

The deliverables should be presented so that they are understandable, useful and relevant for decision-makers at all levels in planning and formulating national and field level disaster risk management and development strategies and policies. All deliverables should be submitted in English and French.

6. DURATION

The assignment is scheduled to be completed over a period of six months. The Consultant Firm / Service Provider would be expected to propose a detailed time schedule for carrying out the activities.

7. IMPLEMENTATION MODALITY AND MONITORING

The disaster risk assessment will be implemented by Consulting Firm / Service Provider with a proven track record and experience in conducting comprehensive hazard assessments and mapping exercises. In the course of undertaking the assignment, the Consulting Firm / Service Provider will participate in a risk assessment governance mechanism established by IOM and which involves relevant stakeholders. IOM Burundi will support the Consulting Firm / Service Provider in terms of facilitating access to information and key partners, monitoring progress of activities and providing overall guidance. The Consulting Firm / Service Provider will ensure close and regular coordination with IOM during implementation. All deliverables will be submitted to IOM for verification prior to final payment.