ADOPTION OF A FLOOD EARLY WARNING SYSTEM IN LIBERIA

DESCRIPTION OF THE TECHNOLOGY

TECHNICAL DESCRIPTION

In recent years, climate change related coastal flooding has become a national concern in Liberia. In an effort to address the direct impacts of coastal flooding in vulnerable coastal communities in Liberia, the Flood early Warning System (FWS) was one of the technologies retained by stakeholders during the Technology Needs Assessment process for climate change adaptation. The FWS was retained to be used in highly affected and flood vulnerable coastal communities to address the problem of destruction of homes, properties and livelihood activities, disruption of coastal habitats, ecosystems and other natural environments.

Flood early Warning System (FWS) is a means of detecting threatening events in advance to help protect lives and properties. In general, it aims at reducing the degree of casualty that could be caused by coastal flooding through alerting the public in advance to take appropriate actions (Response). Such a service is highly important and needed in developing countries such as Liberia where coastal flooding is increasingly becoming a national concern. This technology functions in a way that; once an event exceeds a given threshold, a warning will be issued. THE FWS message is likely to be disseminated to the 'at risk' population. To achieve a successful FWS, a constant monitoring of meteorological and tidal conditions is required in conjunction with river and coastal flood forecasting models. Some benefits of a FWS are:

- A FWS promotes decision making; for example, a frequent high risk flood occurrence environment could be used or reserved for a purpose other than residential;
- The data collected (tidal, meteorological, wave, river, wind etc.) for the FWS service could also be used for mitigation and sustainable environmental planning;
- It promotes human capacity building as a FWS requires technical training of monitoring and forecasting;
- FWS creates job opportunities

TECHNOLOGY READINESS LEVEL (TRL) OR COMMERCIAL READINESS INDEX (CRI)

The current Technology Readiness Level (TRL) for the FWS technology in Liberia can be considered as TRL 3 as indicated below. The technology level of TRL 3 means that TRL 1 and 2 have already been met (*TRL 1: basic principles observed; TRL 2: technology concept formulated).*

This TRL status of the Flood early Warning System in Liberia covers the EU-HLG Technological Research (*pillar 1*). As such, the TRL 3 is specified below.

- *TRL 3 – experimental proof of concept*

AMBITION OF THE TECHNOLOGY

SCALE FOR IMPLEMENTATION AND TIME-LINE

The action plan for the FWS Technology is expected to be implemented for a period of ten years (2021- 2031). After said duration, it is highly recommended to be reviewed and updated as per the current/ prevailing future situation following a needs assessment and gap analysis. The FWS is to be adopted, transferred and diffused at the national level across all coastal areas with emphasis on the most vulnerable and at risk communities.

IMPLEMENTATION OF THE TECHNOLOGY (TRL OR CRI)

The TRL ambition for the FWS technology is at least TRL 5 by the year 2025 considering that funding are made availiable for implementation. *TRL 5* is equivalent to *"technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)"*

The ambition for the technology action plan as it relates to the FWS technology aims to have the flood early warning system adopted, transferred and diffused as a climate change adaptation technology across all highly vulnerable flood areas in the coastal zone of Liberia. Therefore, it should have a relevant TRL to have its objective achieved.

CLIMATE RATIONALE OF THE TECHNOLOGY

In recent years, climate change related coastal flooding has become a national concern in Liberia. In an effort to address the direct impacts of coastal flooding in vulnerable coastal communities in Liberia, the FWS was one of the technologies retained by stakeholders during the Technology Needs Assessment process for climate change adaptation. The FWS was retained to be used in highly affected and flood vulnerable coastal communities in Liberia to address the problem of destruction of homes and livelihood activities, disruption of coastal habitats, ecosystems and other natural environments. In this regard, the Flood early Warning System, which is a means of detecting threatening flood events in advance, will help to protect lives, properties and the environment from current and future potential flooding activities. The FWS is a climate change adaptation technology that seeks to build the resilience of flood vulnerable and affected coastal communities and the environment.

EXPECTED IMPACTS OF THE TECHNOLOGY

The adoption and deployment of the FWS across vulnerable and affected coastal communities will have a positive impact on the lives of children, women, and those with disabilities, who are in most cases the most vulnerable to flooding events. Socio-economic activities and properties will also be protected in advance of the occurrence of floods. With the above mentioned positive impacts, residents of these coastal areas will be highly encouraged and secured to carry out and improve their social, economic and other livelihood activities as the community's resilience will be built.

EXISTING POLICIES IN RELATION TO THE TECHNOLOGY

Nationally Determined Contribution of Liberia (NDC), 2021: Liberia's revised NDC is the nation's 5 years commitment submitted to the UNFCCC. The NDC indicates Liberia's commitment to climate change adaptation targets for eight sectors: Agriculture, Forests, Coastal zones, Fisheries, Health, Transport, Energy and Waste; as well as cross-cutting targets for urban green corridors. The coastal sector's adaptation targets include the construction or implementation of coastal protection systems such as hard engineering methods and also green/ gray environmentally sustainable measures. *"**NDC (2021),** Nationally Determined Contribution of Liberia; submitted to the UNFCCC on August 4, 2021".*

National Policy and Response Strategy on Climate Change (NPRSCC) of 2018: The climate change policy and strategy document is prepared in order to ensure that climate change adaptation and mitigation issues are mainstreamed at policy level and in key sectorial and cross-sectorial development efforts. The NPRSCC includes concrete policy and measures in specific areas on climate change adaption and mitigation, action and resource mobilization plans and monitoring and evaluation framework. *"**NPRSCC (2018),** National Policy and Response strategy on Climate change Liberia, NUDRR Prevention Web, viewed 8 October 2021".*

National Disaster Management Policy of Liberia (NDMP), 2012: The NDMP provides an overall framework for disaster management in Liberia. It particularly aims at integrating risk reduction as appropriate into development policies and planning at all levels of government; including the environment, land, agriculture & forestry sectors, coastal areas and etc.

POLICY ACTIONS NEEDED FOR THE TECHNOLOGY IMPLEMENTATION/DEVELOPMENT/ TRANSFER

ACTIONS AND POLICIES /PROGRAMS IDENTIFIED IN TAP

The TNA's TAP report proposed the below policy action for the FWS adoption, implementation and diffusion across flood vulnerable coastal communities in Liberia.

Action 1: Prepare or identify laws/ legal policies or framework, actors, institutions and strategies to uphold FWS.

With respect to the above policy action, below are the associated activities to make the proposed action work.

- EPA to conduct desk review of existing framework/ policies/ strategies of flood early warning system to incorporate the coastal zone;
- If necessary, GoL should improve or upgrade the existing flood early warning system to an international standard & incorporate coastal monitoring;
- NDMA, create and support local community groups in vulnerable coastal areas to uphold the FWS regulations. It is highly important that these groups consider gender inclusion;
- EPA & NDMA to solicit the support of local vulnerable coastal community leaders to facilitate the adoption, transfer and diffusion of the FWS technology in vulnerable coastal communities across Liberia;

COSTS RELATED TO THE TECHNOLOGY IMPLEMENTATION/DEVELOPMENT/TRANSFER

The cost for the implementation of the above mentioned policy action and its related activities for the implementation and diffusion of the FWS is estimated to be about US $2 850 000 (Two million, eight hundred and fifty thousand United States dollar). The detailed costs for this policy action and those of each of its related activities are available in the TNA TAP report at *https://tech-action.unepdtu.org/country/liberia/*

USEFUL INFORMATION

CONTACT DETAILS & LINKS TO TNA REPORTS

CONTACT DETAILS

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LINK TO REPORTS

1) Liberia's sub-page on the TNA website *https://tech-action.unepdtu.org/country/liberia/*
2) Environmental Protection Agency of Liberia's website https://www.epa.gov.lr/
3) Liberia's Environmental Knowledge Management System website https://ekmsliberia.info/
4) Diversified information for the country https://www.emansion.gov.lr/