

# IMPROVING DISASTER RESPONSE THROUGH A LIVELIHOOD IMPACT BASED (LIMB) FLOOD FORECASTING SYSTEM

## BRIFING NOTE FROM THE NIMFRU PROJECT

This policy brief is for the Ugandan Government and explains how the Livelihood Impact Based System (LIMB) has been designed, built, and put into practice through the NIMFRU project. Importantly it also identifies how this system can support communities and disaster managers to improve disaster response, and has the capability being scaled up across Africa.

## BACKGROUND

Climate change issues (flood, drought, landslides, hailstorms etc) impact every sector of the Ugandan economy, impeding poverty reduction efforts and socio-economic transformation and threatening to derail the National Development Plan (NDPII) to “Strengthen Uganda’s Competitiveness for Sustainable Wealth Creation, Employment and Inclusive Growth”. A multi-sectorial approach is vital for addressing Uganda’s pressing development challenges and “to better understand the impacts of climate change in Uganda and the vulnerabilities of particular groups and populations, so as to better inform future actions” (National Climate Policy, 2015, pg. 16) <sup>1</sup>.

Climate change is leading to an increased climate variability. In East Africa, such variability ranges from futures which are much wetter with extreme rainfall to much hotter with more erratic rainy seasons<sup>2,3</sup>. As such, being able to deal proactively and effectively with flood frequency and volume is becoming increasingly important, particularly to vulnerable communities. Forecast-based Financing (FbF) is an Impact Based Forecasting (IBF) initiative that enables humanitarian funds to be released before a disaster, on the basis of a forecast<sup>4</sup>. This approach was implemented in North Eastern

## EXECUTIVE SUMMARY

- To make early warning and action systems more effective in Uganda, it is essential to develop tools that build the evidence base to support Disaster Risk Reduction (DRR) platforms.
- The NIMFRU (National-scale IMpact based Forecasting of flood Risk in Uganda) Project supports this need by:
  - synthesizing evidence and expertise from multiple disciplines.
  - Using this interdisciplinary approach to create and implement a usable, multiscale platform called the Livelihood Impact Based System (LIMB).
- **The LIMB will:**
  - Provide the much-needed comprehensive flood impact assessments which can inform IBF (Impact Based Forecasting).
  - Focus on floods initially but is applicable to other disasters such as drought.
  - Bring together a rich range of information on climate, hydrology, agriculture, and livelihoods which will provide the evidence base needed for contextual decision making for DRR.

Uganda by the SHEAR-FATHUM<sup>a</sup> project with the aim of improving national response to flood forecasts. However, it encountered difficulties in establishing accurate vulnerability and response thresholds of communities and their exposure to different types of flood threat. Understanding these details is key to making sure that policy and associated flood response systems have sufficient accurate information to react in a timely, targeted manner that support communities in the most appropriate and effective way.

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<sup>a</sup> <sup>a</sup> SHEAR (Science for Humanitarian Emergencies and Resilience) is the project lead on the FATHM (Forecasts for Anticipatory HUMANitarian action)

project. More information can be found at <http://www.shear.org.uk/research/FATHUM.html>.

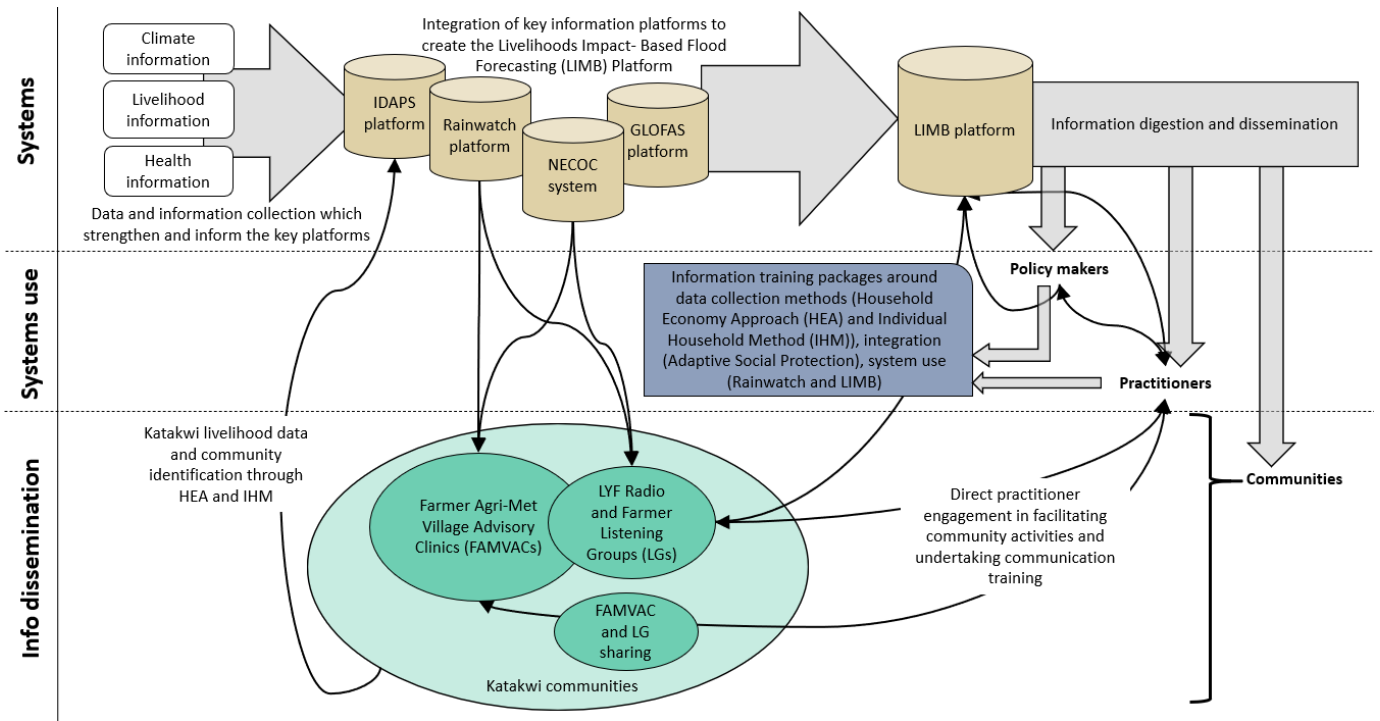


Figure 2: The design of the NIMFRU Project © Walker Institute 2020

## THE NIMFRU PROJECT AND THE LIMB PLATFORM

The NIMFRU project<sup>5</sup> addresses this gap through improving the targeting and communication of flood warning and response to flood affected communities in Katakwi District who are impacted by landslides and flash flooding, as well as seasonal flooding. The project design (Figure 2) integrates interdisciplinary research, innovative communication approaches with capacity building activities to ensure that the LIMB system contains robust information and can be implemented and sustained across the national, district and local governance systems.

### THE LIMB SYSTEM

The LIMB system has been designed around four main open-access, pre-existing information platforms: the RAINWATCH platform<sup>b</sup>, the IDAPS platform<sup>c</sup>, GloFAS<sup>d</sup> flood forecasts (Reference) and the NECOC<sup>e</sup> databases. As shown in Figure 4, the IDAPS platform<sup>6</sup> sits at the center of the system and contains data on people’s livelihoods, such as employment and sources of food and cash income. Information on crops, rainfall and flood forecasts from GloFAS, RAINWATCH and NECOC databases will be integrated with this livelihoods data through the IDAPS platform, to produce impact-based flood

forecasts that show which groups in the community will be impacted by the flood. The integration of these platforms will create an enhanced database – the LIMB system.

Embedding this within the national government structures (here, NECOC) is fundamental to ensuring long-term ownership and management of the LIMB; facilitating the ingestion and storage of vital data on climate, hydrology, agriculture and livelihoods in a central repository will enable disaster managers and decision makers to access to inform policy action as part of an integrated early warning system, grounded in the local context.



Figure 3: Kick off meeting at NECOC Headquarters, Uganda © Walker Institute 2019

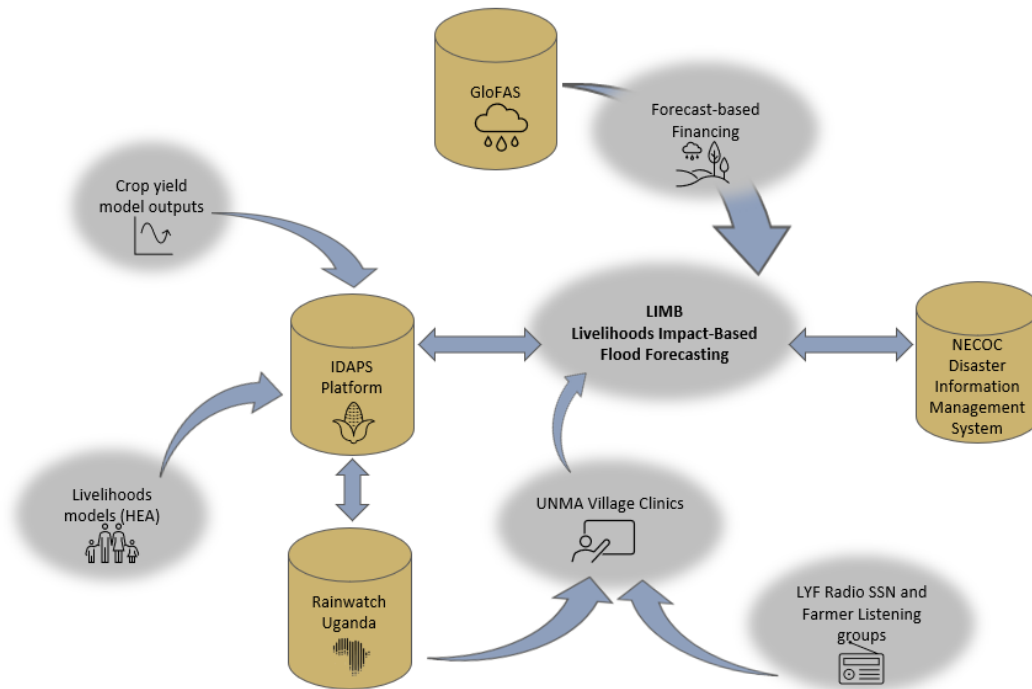
<sup>b</sup> The RAINWATCH platform is an online database that provides use friendly local temperature and rainfall plots (<http://walker.ac.uk/rw/>)

<sup>c</sup> The IDAPS platform is a cloud-based database that brings together data from climate, agronomy and hydrology to model the impact of climate scenarios on people’s livelihoods and their ability to access their basic food

and non-food needs (<http://www.walker.ac.uk/research/projects/idaps-integrated-database-for-african-policy-makers/>)

<sup>d</sup> GloFAS is the Global Flood Awareness System which integrates weather forecasts with a hydrological model (<http://www.globalfloods.eu/>)

<sup>e</sup> NECOC is the Uganda National Emergency Coordination and Operations Centre (<http://www.necoc-opm.go.ug/>)



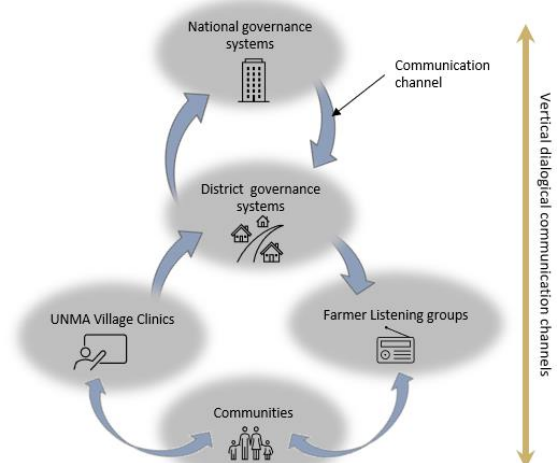
**Figure 4: The LIMB system**  
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### KEY FEATURES OF THE LIMB:

- Integrates multiple pre-existing platforms to create a single, centralised system giving access to the full range of data needed to understand the multiple, inter-connected aspects of the impacts and implications of a natural disaster on people’s livelihoods.
- Makes use of pre-existing sources of rich, robust, and trusted data.
- Uses well-established methodologies, including the Household Economy Approach (HEA) to collect comprehensive livelihoods data across all wealth groups enabling meaningful and targeted responses.
- Stores all the data so it is accessible for future use e.g., reviewing historical trends, and geographical and environmental comparisons.
- Is flexible so it can be used in different geographical locations, at scale, and to support responses to different types of natural disasters.
- By the end of the NIMFRU project, the LIMB will be a tried and tested model with measurable impact which is embedded into governance systems.

### OPENING COMMUNICATION CHANNELS

A vital part of the NIMFRU project is bridging the national and district disaster management governance systems and building capacity at the community level. Farmer listening groups and UNMA Village Clinics (FAMVAC)<sup>7</sup> have been developed and piloted to provide communities with timely and relevant information and upskill key district extension people on processing, translating, and sharing the information from the LIMB system with their communities. This strengthens the vertical communication channels (Figure 5) that are essential for ensuring that information is



**Figure 5: Vertical communication channels**  
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accessible and relevant to decisions makers at every level, whether a Katakwi householder, the local Red Cross team or a national disaster manager.

## LONG TERM OUTCOMES

The development of this improved livelihoods impact-based flood forecasting system (the LIMB) and the integration of information on livelihoods, crops and climate at national level will enable Ugandan policy makers to develop robust national-scale impact-based forecasting that can better manage flood risk. Drawing on synthesised evidence we expect this to lead to:

- Better targeted infrastructure investment in e.g. transport, power, buildings, health services, people/training etc) for improved flood risk management, and,
- Improved contingency planning through better understanding of the amount of aid needed for different districts.

## SUPPORTING COMMUNITIES AND DISASTER MANAGERS TO IMPROVE DISASTER RESPONSE: RECOMMENDATIONS

To ensure that the LIMB system develops into a sustainable and practical model for improving long-term early warning actions and response systems, the following recommendations are made:

- Active ownership, maintenance and use of the LIMB model by national government agencies. This requires policies and plans for regular, targeted data collection and input from all agencies involved in flood disaster management. This data resource will be widely applicable and useful for managing other disaster risks, such as drought or famine.
- Embedding staff capacity building at multiple levels (community, district, regional and national). This will ensure that the information being put into the LIMB system is reliable, accurate and useful.
- A clear, structured communication protocol and channel network between local communities and local and national disaster agencies. This will ensure that disaster risk information is used effectively to inform both ground- and high-level decision-making processes.
- Support for the initial phase of system development should be prioritised by the wider international research and donor community to ensure resources are available for the necessary capacity building, training, and system set up. This will enable the model to be owned, maintained, managed and utilized by national government agencies and support mass roll out of the system.



**Figure 6: Katakwi Community Members, Uganda**  
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