

REDUCING THE COST AND IMPACT OF DISASTERS

NATIONAL – SCALE IMPACT BASED FORECASTING OF FLOOD RISK IN UGANDA

NIMFRU (National-scale Impact Based Forecasting of Flood Risk for Uganda), is a multi-partner project which aims to improve the targeting, relevance and communication of flood warning and response in Uganda. It responds to the need from the Forecast-Based Finance community for Impact-Based Forecasts at a national scale, through a new approach that complements comprehensive flood impact assessments with basic household economy/socio-economic information, to guide preparedness, protection, and response. These assessments will ensure that key decision makers, from local to national levels, have the evidence-base they need to deliver timely and targeted interventions to minimize the impacts of flooding on lives and livelihoods.

NIMFRU PROJECT OBJECTIVES

1. To integrate and synthesise multi-sectoral information (climate, hydro, livelihoods, crop) for robust impact-based flood forecasting.
2. To add the missing dimension of livelihood impact to FATHUM's work and provide analysis of the sensitivities and vulnerabilities of different population groups to flood events.
3. To strengthen national/sub-district capability to scale out and make use of the new integrated multi-sector Livelihoods Impact-Based (LIMB) Forecasting system that fills a critical gap in managing flood risk in Uganda.



*Figure 1: Fishing boats in Katakwi, Uganda.
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INTRODUCTION

Climate change is leading to 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^{1,2}. Given this, taking earlier, right, and proportionate action is vital for effective flood risk management to avoid loss of life and protect the **most vulnerable** households. Forecast-based Financing (FbF) aims to ensure humanitarian funds to be released on the basis of a forecast, before a disaster takes place³. This Impact Based Forecasting (IBF) approach was implemented in North Eastern Uganda by the SHEAR – FATHUM project^a to improve the national response to flood forecasts. However, flooding does not affect everyone in a community equally. The FATHUM project encountered difficulties establishing accurate vulnerability and response thresholds at community level, and their exposure to different types of flood threat. Understanding the local economic and social context of communities is vital to making sure that flood response systems have sufficient and accurate information to react in a timely and targeted manner that supports peoples' coping strategies and choices.

THE NIMFRU APPROACH

To understand and successfully integrate the complexity of the local economic and social context into flood forecasting, evidence from multiple disciplines including climate science, hydrology, agriculture, socioeconomics and livelihoods needs

^a SHEAR-FATHUM project: <http://www.shear.org.uk/research/FATHUM.html>

to be synthesised. The NIMFRU project responds to this need by bringing together an interdisciplinary team that bridges both national institutions and community structures in Uganda and physical and social sciences. This interdisciplinary approach enables analysis and integration of multiple information sources into one platform – the Integrated Database for African Policymakers. Information on flood forecasting, livelihoods, crop yield and rainfall will be integrated through the IDAPS platform to create the Livelihoods Impact-Based Flood Forecasting (LIMB) system (Figure 2).

The LIMB platform will be embedded within the Office of the Prime Minister’s (OPM) national disaster management system to strengthen the evidence base for the government’s investment decisions in an expansion of other disaster risk financing approaches. On the request of the Uganda Office of

the Prime Minister (OPM), the NIMFRU project is targeting its research on the Katakwi district which experiences severe seasonal and flash flooding with the aim of upscaling this approach across Uganda.

LIVELIHOODS IMPACT-BASED FLOOD FORECASTING (LIMB) SYSTEM

Information on flood forecasting, livelihoods, crop yield and rainfall will be integrated through the IDAPS platform to create the Livelihoods Impact-Based Flood Forecasting (LIMB) platform (Figure 2). The project brings together three primary technological information platforms through the IDAPS⁴ platform: the RAINWATCH platform^b, GloFAS flood forecasts^c and the NECOC databases^d.

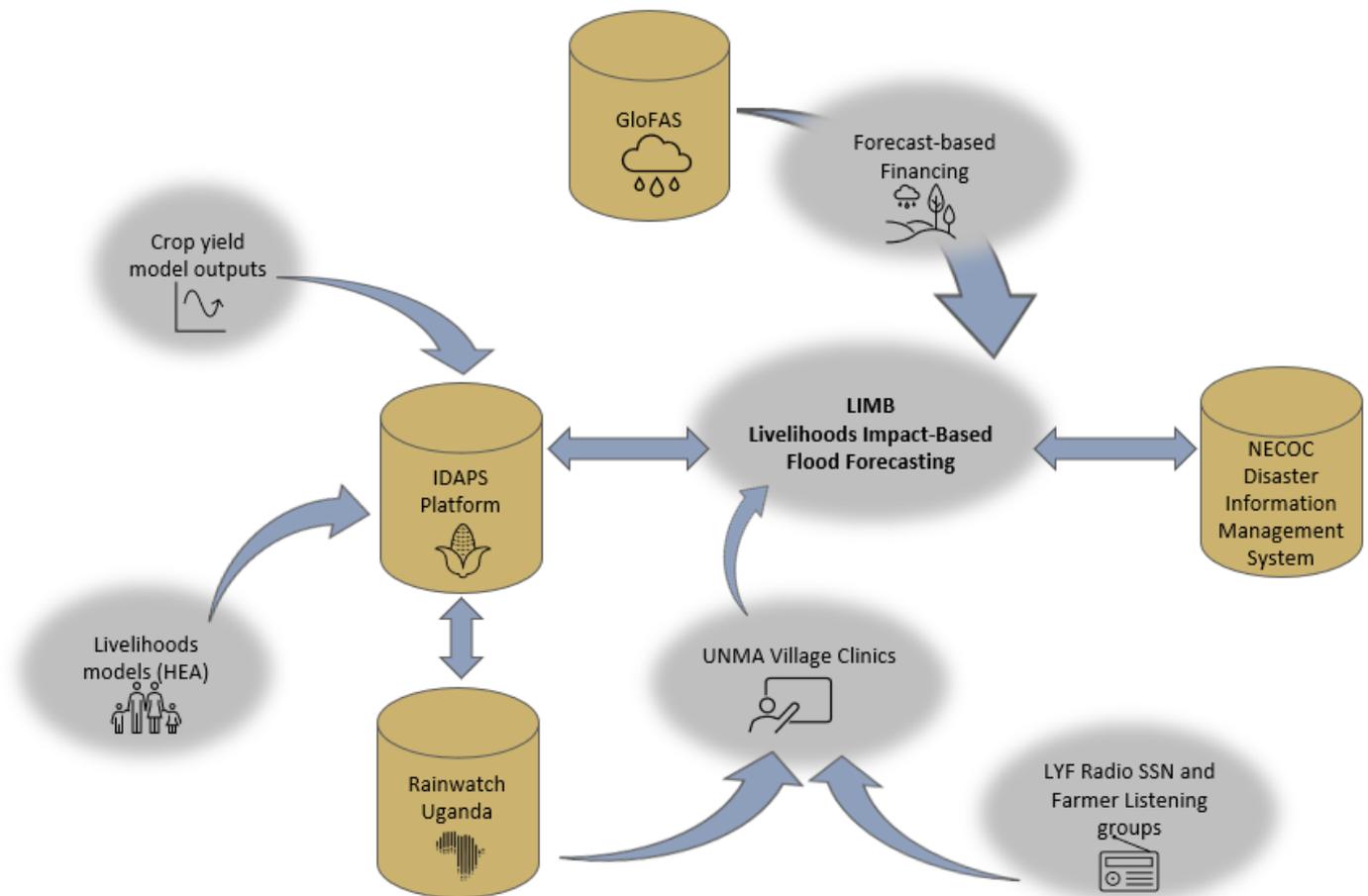


Figure 2: Schematic diagram showing the different data sources that are integrated into the LIMB
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^b The RAINWATCH platform is an online data based that provides use friendly local temperature and rainfall plots (<http://walker.ac.uk/rw/>)
^c GloFAS is the Global Flood Awareness System which integrates weather forecasts with a hydrological model (<http://www.globalfloods.eu/>)

^d NECOC is the Uganda National Emergency Coordination and Operations Centre who own the national Disaster Management Information System used by the LIMB system (<http://www.necoc-opm.go.ug/>)

COMMUNICATION AND ALIGNMENT WITH POLICY

The NIMFRU project has been carefully designed to align with the existing disaster risk infrastructure and policy framework in Uganda. This will ensure there are clear channels for communication which link communities and district disaster management structures with national climate and disaster policy processes. National investment and active involvement in the maintenance and regular updating of the LIMB through capacity building with local higher education institutions will provide a solid basis for long term national policy ownership and continued operation.

At the community level, the NIMFRU project is strengthening disaster risk reduction infrastructure and systems by upskilling relevant disaster risk reduction services in the use and dissemination of LIMB information. In parallel to the development of the LIMB system and in partnership with the Ugandan National Meteorological Authority (UNMA), the NIMFRU team is supplying communities with timely and relevant flood information through the communication platforms of the Farmer Listening Groups and Farmer Village Clinics ^{5,6}. This element increases accessibility of flood information by opening and strengthening key local communication channels.

The successful development of the LIMB and associated capacity building processes will enable Ugandan policy makers to make informed disaster risk reduction decisions based on flood risk and vulnerability data. The opening of

communication channels between local communities, disaster agencies and UNMA will ensure that information can reach communities to enable on the ground preparedness and improved resilience.

SCIENCE INTO POLICY AND PRACTICE

NIMFRU is using an interdisciplinary and collaborative approach to ensure that not only is there development of novel science that underpins the LIMB model, but also that this new science is useful, applicable, and accessible to a wide range of stakeholders. Such stakeholders include policy decision makers from multiple governmental agencies and the varying practitioners that support disaster response.

Careful translation of scientific findings are therefore needed throughout and beyond the project to ensure they are accessible and useable for all stakeholders. This translation process involves creating open communication between all stakeholders, facilitating activities that challenge perceptions and blockages between disciplines, organizations and institutions, and fostering and nurturing connections and relationships amongst diverse groups. This is vital for the NIMFRU project to integrate different types of data and academic disciplines, and to ensure the sustainability of the use, management, and ownership of the LIMB by national stakeholders.

However, measuring the impact of interdisciplinary and collaborative research can be challenging. The NIMFRU project has embedded a novel Interdisciplinary Research

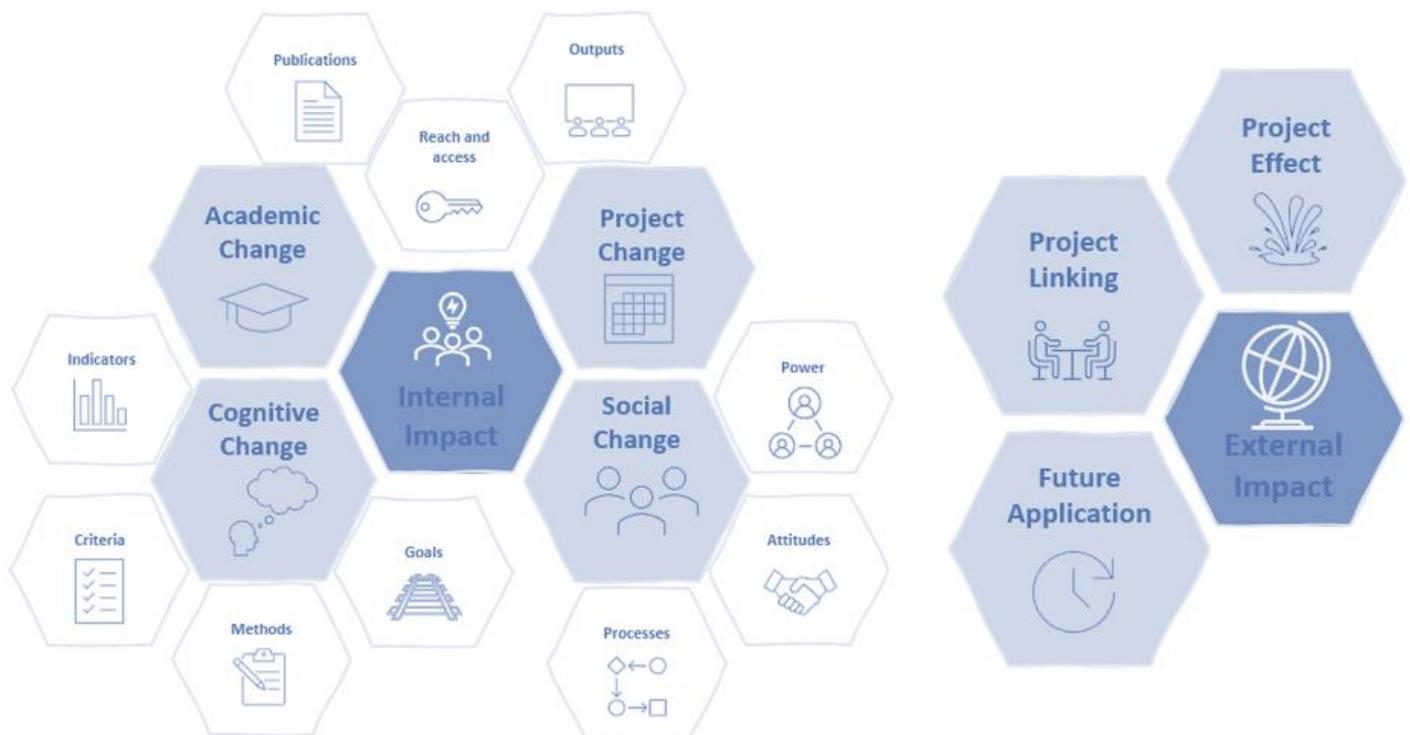


Figure 3: Different areas for consideration to ensure effective translation of science into policy and practice © Walker Institute 2021

Impact Framework (Figure 3) to tackle this challenge and help communicate the benefits of interdisciplinary working). The framework has been designed with the aim of tracking internal impact (such changes in attitudes, connections, and integration between the project stakeholders) as well as the more traditional external impact (the impact of the project on its target audience such as communities, farmers, and governance structures).

The NIMFRU project design embeds this framework throughout all project processes and stages. Initial impact analysis using this framework demonstrates that the NIMFRU integrated interdisciplinary approach is fundamental to improving the targeting and communication of flood warning and response.

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REFERENCES

1. Burgin, L. *et al.* *FCFA HyCRISTAL Climate Narrative Urban Infographic and Brief.* (2019) doi:DOI: 10.5281/zenodo.3257302.
2. Burgin, L. *et al.* *FCFA HyCRISTAL Climate Narrative Rural Infographic and Brief.* (2019) doi:10.5281/zenodo.3257287.
3. Red Cross Climate Centre. *FbF Practitioners Manual.* <https://manual.forecast-based-financing.org/> (2021).
4. Cornforth, R., Clegg, D. & Petty, C. *The Integrated Database for African Policymakers.* (2020) doi:10.5281/zenodo.3701721.
5. Asare, K., Cornforth, Rosalind Tarhule, A., Osbahr, H., Ciampi, L. & Myers, J. *RAINWATCH Handbook: A step by step guide to using RAINWATCH, version 1.0.* (2019) doi:10.5281/zenodo.3366367.
6. Ciampi, L. *et al.* *FAMVAC and Listening Group Facilitation Handbook.* (2019) doi:10.5281/zenodo.3369279.