A SET OF INSPIRING IMPACT STORIES FROM THE SCIENCE FOR HUMANITARIAN EMERGENCIES AND RESILIENCE PROGRAMME 2016-2022

**N**SHEAR

# SHEAR impact



Emergencies & Resilience

## → Preface

The Science for Humanitarian Emergencies and Resilience programme (SHEAR) has been championing reducing disaster risk since 2016/2017. Funded by the United Kingdom's Foreign, Commonwealth and Development Office (FCDO) and Natural Environment Research Council (NERC UKRI), SHEAR involved unique interdisciplinary collaboration among practitioners and humanitarians that looked at ways to improve our understanding of climate-related risks as well as forecasts and early warning systems, in parallel with enhancing humanitarian actions to reduce this risk.

SHEAR focused primarily on working in Sub-Saharan African and South Asian countries Bridging science and humanitarian practice has proved highly rewarding, offering many advances in the early warning of landslides, for example, and forecast-based action for hydrometeorological hazards.

During its lifetime SHEAR has achieved some impressive outcomes: Nearly 100 research projects and grants Work in at least 18 countries around the world Nearly 70 global partnerships Support to nearly 60 early-career researchers Over 100 peer-reviewed papers (and counting) At least 30 knowledge products (and counting).

The project ended this year; this report offers a taste of several impacts that the SHEAR programme has had over the years. These are but a few examples of this legacy.

We are grateful for the opportunity to advance collaboration by scientists and humanitarians and we continue to strive to scale up the many lessons, experiences and tools that SHEAR has brought, ensuring that its legacy will endure well beyond the programme itself.

The SHEAR Knowledge Broker Team: Practical Action Consulting Red Cross Red Crescent Climate Centre

#### Authors

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Practical Action Consulting and Red Cross Red Crescent Climate Centre

Report compiled in March 2022

# Acknowledgements

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	AGENCIES 6	FLOOD INFORMATION DURING CYCLONES IDAI AND KENNETH SUPPORT	MOZAMBIQUE EMERGENCY
	PRODUCTS IN. INDIA AND KENYA.	EARMERS' LIVELIHOODS THROUGH IMPROVED MONITORING	INDIA AND KENYA PROTECTING
		RESEARCH ENABLES SCALED-UP LANDSLIDE FORECASTING	PARTICIPATORY
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FORECASTING PROJECT IN UGANDA	ELOODS FLOODS THROUGH THE NATIONAL-SCALE IMPACT-BASED	TOGETHER EXPERTS AT EVERY LEVEL TO ENHANCE EVIDENCE-BASED	UGANDA BRINGING
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#### Kenya



#### CONTEXT

Kenya suffers from recurrent droughts, which impact lives, rural livelihoods and food security. Currently on average, 6.5 million people are affected by drought (1.3 percent of the population) per year, and this may increase up to 34 percent of the population by 2050 due to increasing exposure and climate change<sup>1</sup>.

Disaster risk management efforts are currently insufficient to meet this challenge. There is a well-established drought management system, but this is largely reactive rather than anticipatory. For the 23 counties classified as arid and semi-arid (out of 47), the National Drought Management Authority (NDMA) of Kenya produces a drought bulletin each month, reporting on drought conditions and recommended actions. Actions are typically invoked only after a drought declaration, and reporting of drought conditions depended on observations rather than projections for the near future.

## most vulnerable in Kenya improved seasonal forecasts protect the Informed decision-making based on

#### ACTION

The ForPAc team (which stands for Forecast-based Preparedness Action) has been working to address two key challenges: improving forecasts, and improving preparedness actions. To that end the project brought together researchers and agencies mandated for forecasting and risk management in a process of 'co-production' of new forecast information and use.

Forecasting was strengthened by drawing on the best available international science, global and regional modelling. The team developed a suite of new forecast products of decision-relevant indicators, like rainfall, vegetation, and soil moisture for drought across a range of forecast lead times, from days to months. The skill of these forecasts was thoroughly evaluated to help build trust in forecast-based actions.

ForPAc has worked with mandated agencies to demonstrate the potential of this new suite of prototype forecasts products and of the systematic approaches to making decisions based on forecasts. Preparedness actions were strengthened by designing anticipatory decision-making processes within the existing systems, triggered by these forecast products to reduce the drought hazard impacts. These new forecast products were piloted with the relevant risk management agencies, building an understanding of the products and their use in evidence-based decision-making.

CIMA. 2018. Disaster Risk Profile Kenya. https://www.preventionw files/64257\_kenyareporteviewedweb.pdf

Additional information:

https://www.icpac.net/our-projects/forpac/\_ https://gtr.ukri.org/projects?ref=NE%2PP000673%2P1\_ http://shear.org.uk/research/ForPAc.html

#### IMPACT

Several mandated agencies in Kenya, such as the Kenya Meteorological Department (KMD) and in the region ICPAC (IGAD Climate Prediction and Application Centre), Regional Earth Observation Centre and RCMRD (Regional Centre for Mapping of Resources for Development) are now confidently and independently producing forecasts using ForPAc's co-developed methodology. As a result of the advances in operational forecast systems for drought in Kenya and increased confidence in the forecasts, the National Disaster Management Authority (NDMA) now shares drought forecast information in the national drought bulletins with advisories on appropriate actions, helping farmers to better anticipate and prepare for drought conditions to reduce their impacts -including during the 2021-2022 drought.

The collaboration and co-design have cemented partnerships among agencies involved and gave a platform for Kenya Red Cross and the NDMA to explore the potential of a drought management system that incorporates forecast-based actions in the future, which would mean a shift from a reactive system to an anticipatory approach. The national drought management system is currently undergoing a review. Kenya Red Cross Society has incorporated the drought (and flood) forecasts into the new operational Early Action Protocols which are designed to align with the national system.

Lessons learned during the ForPAc project for drought forecasting in Kenya are also shared widely in the region. This will be taken forward by the regional forecasting agency ICPAC which has developed a roadmap for forecast-based actions for drought across the region.



#### Uganda



Using global models in local early warning for floods: Overcoming data gaps to save lives in Uganda

#### CONTEXT

Each year, floods impact over 50,000 people and cause extensive damage across Uganda. However, in many flood-prone locations in the country and the region, early warning capacity is not well developed, nor is there clarity on what should be done if certain types of flooding are forecasted. Part of this gap is the lack of forecast models which can indicate when and how river levels are increasing. This limits the potential for preparedness actions that build the resilience of local communities.

#### ACTION

enabling forecasts to be accessible for reporting locations have been coded into sub-saharan Africa, fifty-one additional to benefit local decision-making by FATHUM worked to improve GloFAS of the global flood model GloFAS. closely with the Ugandan Red Cross each in Mali and Mozambique, while the the web platform. This includes 24 in strategic and vulnerable locations. Across development of the GloFAS web interface with in-country partners supported the GloFAS skill assessments. Collaboration usability by improving the relevance of forecast triggers and advising on the use warning, what might be appropriate what forecasts are suitable for flood early FATHUM's work included assessment of hydrological forecast information. action ahead of disasters based on preparedness work and humanitarian Water and Environment to expand their Society and the Ugandan Ministry of University of Reading have been working Action (FATHUM) researchers at the Forecasts for Anticipatory Humanitarian Kenya (the first there), eight new points

#### IMPACT

ot improvement needed to the GloFAS quality control for flood forecasting countries in Sub-Saharan Africa, up the concept of Forecast-based enabled the Uganda Red Cross to scale coverage of GloFAS and support to the developers. The improvement in the Uganda Red Cross and Ministry for observed water levels and GloFAS for key locations, as well as supporting levels. This helps day-to-day forecasting be made with observed river water and physical gauges, enable hydrologica including Kenya, Ethiopia and Zambia. the use of flood forecasts in other Financing in Uganda, and has spurred forecasting system in general have forecasts, but also highlights the areas Water and Environment for using the forecasts not only gives confidence to science. The direct comparison between locations where direct comparisons can The new measuring points, both virtual forecasts to be accessed in real-time at

three to 14.

total in Uganda has now increased from

## Mozambique



CYCLONE IDAI, MOZAMBIQUE, RESPONSE, 18-20 MARCH 2019, PHOTO: DENIS ONYODI IFRC-DRK-CLIMATE CENTRE

#### CONTEXT

In March and April 2019, two intense tropical cyclones (Idai and Kenneth) made landfall in Mozambique. While many think of destructive winds during tropical cyclones, intense rainfall causing inland flooding and coastal flooding because of high waves and storm surges are often much more dangerous. Rainfall consequences can last much longer, are more widespread, and often hamper the humanitarian response in the critical weeks and months after the disaster. Humanitarian and civil protection agencies, therefore, need to have access to high-quality and actionable forecast information on rainfall and potential flood risks. However, many challenges remain for international organizations to use forecasts systematically to respond ahead of disasters.

## Emergency flood information during Cyclones Idai and Kenneth support humanitarian agencies

#### ACTION

spatial extent of rainfall, alongside flood forecast information on the predicted tropical cyclone tracks and the amount and a month later Cyclone Kenneth was predicted to hit collaborated to provide real-time emergency flood bulletins to The FATHUM, HYFLOOD and PICSEA project teams Cross, and academics from the technical university of Cross partners. Later researchers from PICSEA, FATHUM and Affairs (UN OCHA), the Mozambican authorities and the Red outlined potential flood impacts. These were shared with the bulletins covered the weather forecast, flood forecast and using the Global Flood Awareness System (GloFAS) model. The Mozambique. The bulletins provided probabilistic information services. Starting with Cyclone Idai, the team was prepared when in 2019, produced alongside forecast information and warnings humanitarian agencies responding to Cyclones Idai and Kenneth collaborations and strengthening existing collaborations. forecasting and taking action ahead of cyclones, forging new Mozambique to exchange experiences and ways forward for HYFLOOD traveled to Mozambique and met together with United Nations Office for the Coordination of Humanitarian from the national meteorological and hydrological forecasting nydro-services, the national disaster institute, Mozambique Red epresentatives from the national, regional and local met- and

#### IMPACT

Tropical Cyclone Batsirai in February 2022) (e.g. for Tropical Depression Ana in January 2022, and for bulletins for FCDO and humanitarian partners on a regular basis Ocean. Collaboration is ongoing, and the team now produces cyclones Idai and Kenneth, PICSEA developed a free online kits ahead of cyclone landfall. Building on the experiences during region most likely to be affected, through sending an assessment bulletins, live-saving interventions could be set up targeting the medium reached a wide range of decision-makers. Based on the day for response planning. The information from the bulletins training course about tropical cyclones in the southwest Indian reference point during disaster response) and through this was used for the daily situation reports by UN OCHA (a key humanitarian agencies, information could be used on the same the bulletins were developed in real-time with feedback from the was considered extremely valuable, innovative and promising. As impact-based forecasts in one bulletin, the type of information involved. Because of the combination of weather, flood and had been provided in real-time to the humanitarian agencies indicate that this was the first time that flood risk information action in Mozambique before, during, and after Cyclone Idai and These bulletins were used to inform decision-making and early team and preparing hygiene kits, tarpaulins, and water treatment about the areas which would be most affected. Evaluations Kenneth, improving response by providing key information

"This is the first time we have been able to use science so early in both planning for and responding to the devastating impact of cyclones." [PROFESSOR CHARLOTTE WATTS, CHIEF SCIENTIFIC ADVISOR FOR DFID]

#### Additional information:

Online free course on tropical cyclones in the southwest Indian Ocean: www.the-iea.org/picsea Budimir et al., 2021 (in review), Development of forecast information for institutional decision-makers: landslides in India and cyclones in Mozambique, Geoscience Communication Emerton et al., 2020, Emergency flood bulletins for Cyclones Idai and Kenneth: a critical evaluation of the use of global flood fore arian preparedness 810 and response, International Journal of Disaster Risk Reduction



# India and Kenya



#### CONTEXT

protect farmers against weather risks. high-productivity agriculture. Yet, to protects farmers against financial risk: are under threat from extreme weather farmers across the developing world datasets to reduce basis risk and better environmental modelling and big insurance by using state-of-the-art project worked to improve the current limited. The Mitigating Basis Risk developing world have been extremely date, the success and uptake of crop traps and invest in climate-smart help farmer households escape poverty due to climate change. Crop insurance increase significantly in future years events, such as droughts, floods, and poor performance of index-based crop insurance schemes across the has been widely advocated as a tool to posed by extreme weather events and heatwaves, with risks projected to Livelihoods of millions of smallholder

#### ACTION

and credit support mechanical (crop damage caused by hail/ Asia, helping to mitigate financial risks assessment, which captures both abiotic to provide an accurate yield loss crop insurance program for rice. The subsequent work with the Mahalanobis proof of concept work focused on wheat combination with agricultural advisories in other climate-smart technologies in faced by farmers and unlock investments used and applied in picture-based innovative approaches are being further smallholder agricultural systems. These determinants of crop losses in wind, animal trampling, etc.) (e.g. heat and water stress) and monitoring with crop simulation models project integrated smartphone-based cost-effectiveness of the Indian national improving the performance and in India's northwest breadbasket, models, smartphones, and satellite yield estimation - combining crop approach for scalable and low-cost crop The project has developed a new insurance products across Africa and (MNCFC) of India focussed on National Crop Forecasting Centre imagery in an innovative way. Following

#### **MPACT**

outperforms traditional crop support improved access to credit prediction, the approach is now also over 30 million farmers. The learnings monitoring system that currently serves government to develop new data-driven are supporting efforts by the India, the tools by Mitigating Basis Risk more effective crop monitoring. In smartphone images for simplified and demonstrating the potential of using monitoring through either satellite reliable information about the timing of shown that this method can provide smallholder farmers. The research has insurance design and provision for farm management practices and incentivise the adoption of improved more competitively priced products to for smallholder farmers. Beyond loss efforts to improve insurance products from this project support ongoing approaches to transform a national crop remote sensing or national crop surveys. key crop growth phases and improved data-driven approach to crop This framework provides the basis for an insurers in India, Ethiopia, and Kenya to insurance projects, including helping applied to improve the design of

KATAKWI LIVELIHOODS 2019, PHOTO: LUISA CIAMPI/ KATAKWI LIVELIHOODS.

> Additional information: https://gtraiktiong/projects?ref=NE%2FR014094%2F1 https://www.ifptiong/project/PBInsurance

MOZAMBIC

INDIA

amongst marginalised farmer groups.

#### India

CO-DEVELOP THE STRUCTURE FOR THE FORECAST BULLETIN IN NOVEMBER 2019 TO GOVERNMENT (GSI) IN KOLKATA WORKING WITH THE INTERDISCIPLINARY RESEARCHERS A GROUP OF LANDSLIP

#### CONTEXT

large geographical areas can be challenging. triggers, developing landslide models, and determining thresholds to support early warning. However, acquiring consistent quantity and quality data in difficult terrain over forecast. Capturing data about landslide o<mark>ccurrence is</mark> key to understanding landslide regional-scale forecasting systems mean that the forecasting of landslides is complex to induced factors in the triggering of landslides, and highly localised conditions mean that development can increase their impact. The combination of environmental and humanmining etc) can increase the likelihood of landslides and increased exposure as a result of rainfall and/or earthquakes. Certain land management practices (e..g. Deforestation, livelihoods, infrastructure, and propert<mark>y every year<sup>1</sup>. Landsli</mark>des are primarily –triggered by About 12.6% of India is prone to landslides, causing significant loss and damage to lives,

# scaled-up landslide forecasting in India Participatory research enables

#### ACTION

in India. It aims to help build resilience with early warning and their study areas. daily landslide forecast bulletins to the District Authorities in models developed within the project and issued experimental 2021, GSI, supported by LANDSLIP partners, ran the forecast Survey of India (GSI). During the monsoon seasons of 2020 and between research partners, local organisations, and the Geologica locations in India (Nilgiris and Darjeeling), as a close collaboration early forecasting system for rainfall-induced landslides in two pilot The LANDSLIP project developed a prototype regional landslide preparedness actions that can reduce the losses for communities improving landslide assessment and forecasting at a regional scale The LANDSLIP project is contributing to understanding and

establishment of a prototype, government-led, regional landslide app (available in Google Store), with content further developed by approach. Amrita University developed a landslide tracker mobile Key to the development of these prototypes is consistent local early warning system. innovative, collaborative approaches have enabled the understanding of local weather regimes and landslide the UK Met Office and NCMRWF<sup>2</sup> the project advanced Building on this landslide occurrence information, together with standardised collection of landslide occurrence information. the entire LANDSLIP team. This supports the systematic and from the LANDSLIP consortium co-developed a landslide tracker landslide data collection. Working with local partners (Save The (for short-range and medium-range forecasting). These susceptibility to identify suitable local landslide warning triggers Hills, Darjeeling, and Keystone Foundation, Nilgiris), partners

Geological Survey of India (GSI). Landslide Hazard. Accessed March 2022. The National Centre for Medium Range Weather Forecasting

N

Additional information:

SHEAR. 2019. LANDSLide multi-hazard risk assessment, Preparedness and early warning in South Asia: integrating meteorology, landscape and society, LANDSLIP Factsheet, Accessible from: https://practicalaction.org/wp-content/uploads/2019/07/LANDSLIP-factsheet.pdf  $LANDSLIP\,Global\,Knowledge\,Products.\,Available\,at:\,http://landslip.org/outputs/globalknowledgeproducts.html and the second seco$ LANDSLIP (2021) Home web page [Online] Available at: http://www.landslip.org/

Amrita Vishwa Vidyapeetham University (2021a) Landslide Tracker Mobile Application. Google Play Store. Available at: https://play.google.com/store/apps/details/ideedu.awna.amrita.mht

#### IMPACT

other parts of India by 2030, providing crucial information to is aiming to develop similar landslide early warning systems in engaged with District Authorities to ensure the daily experimental co-produce tools that are meaningful and useful. GSI has also landslide early warning system, LANDSLIP has enabled an In addition to the newly developed prototype of a regional through the establishment of a landslide forecasting centre, which landslide forecasting and early warning during the LANDSLIP plans. The advancements and knowledge gained in regional-scale supporting District Authorities in determining preparedness landslide forecasts issued are appropriately understood, thus aware of the importance of engagement to share perspectives and within its two case study areas. Different actors are now more Global Survey of India (GSI), local NGOs, and District Authorities increased dialogue between academics, national government/ project will be taken forward beyond the project lifetime by GSI

by the LANDSLIP project at all levels have The knowledge and experiences generated tunding organisations in terms of not only assure lasting success and sustainability the outcomes, but also the meticulously especially the bilateral and multilatera processes, legacy documents etc. that "LANDSLIP has proven to be a shining been commendable and noteworthy. example for the donor community designed, iteratively implemented

# [WG CDR (RETD) PRAFUL RAO, SAVE THE HILLS

authorities to initiate preparedness activities.

INDIA





### PHOTO: DENIS ONYODI/KRCS

#### CONTEXT

Africa's smallholder farmers are the main producers of food on the severe staple crop yield gap and widespread food insecurity. therefore struggle to optimize crop yields, underpinning Africa's approximately 175 million people), only 4% are irrigated. Farmers estimated 33 million smallholder farms across Africa (employing otherwise allow them to adapt to weather variability. Indeed, of the mitigation strategies, such as irrigation and re-planting, that would particularly vulnerable to the types of extreme weather expected to population living in extreme poverty. Poverty makes farmers continent, but also represent the largest portion of Africa's increase due to climate change; most cannot afford expensive

particularly those with limited literacy and education. actionable to a large number of farmers in a timely manner, challenge in packaging information so that it is understandable and immature technologies for producing information at sufficiently provision of local, scientifically credible guidance has been limited by seen available to smallholder farmers for two reasons: Firstly, the therefore provides a clear pathway towards improving yields and when to plant can reduce yields by 7-10%. Optimizing planting dates Analysis of historical data suggests that suboptimal decisions on nigh-resolution. Secondly, there is a significant communications reducing food insecurity, but such information has not historically

#### support for smallholder SatWIN-ALERT farmers in Africa through Evidence-based decision

#### ACTION

advice on planting. available from meteorological services, advice is predominantly provided to example, ICPAC produces maps of county or sub-national level) may also be in-person agricultural extension services smallholder farmers via over-stretched translate bulletins into meaningful those with limited literacy, are unable to however, many farmers, particularly seasonal onset for East Africa. Practically often distributed through bulletins. For Lower resolution information (e.g. at Currently, local agricultural management

partnership with One Acre Fund (OAF). have been shared with >500,000 farmers two years, advisories based on the DST seasonal drought forecasting system. For the TAMSAT-ALERT soil moisture and support tool (DST) for planting, based or SatWIN-ALERT developed a decision in southern and eastern Africa, in

#### http://www.tamsat.org.uk/ https://satwin.iri.columbia.edu/ Additional information:

#### MPACT

Comparison of planting date, optimal farmers who plant near the DST planting dates showed a potential plant later than the optimal time, with planting date and yield suggests that recommended date. improvement in yield of 7-10% for Evaluation of the DST recommended significant detrimental impact on yield farmers in southern and eastern Africa

earlier than usual. Based on income of the farmers said that they planted said that they felt confident to plant after the guidance. In Zambia, 81% of farmers receiving the advice. The majority of additional \$3.8M in income. farmers next season, it will result in an pilot study, OAF estimates that when the improvements and adoption rates in the receiving the guidance. In Uganda, most and Uganda (72%) said that they trusted farmers in Kenya (95%), Zambia (78%) however, are evaluations by the farmers DST is provided to all their Kenyan More important than the desk analysis,

https://rmets.onlinelibrary.wiley.com/doi/10.1002/met.195



#### Uganda



PHOTO: JAKOB DALL/DANISH RED CROSS LIVELIHOODS AND WERE LEFT WITH NOTHING MANY PEOPLE LOST THEIR CROPS, THEIR UGANDA WAS HIT BY SEVERE FLOODING IN 2007

#### CONTEXT

policymakers, local councils and local farmers to improve the targeting Based Forecasting Flood Risk in Uganda project – known as NIMFRU major flooding, as well as flash flooding Uganda is chronically affected by flooding, both by seasonal events and relevance and communications of flood warning and response in is a partnership project that is engaging with researchers. messages often fail to motivate actions. The National–Scale Impact– While forecasting science for flooding is rapidly improving, warning Uganda, focussing on Katakwi district. Katakwi District in Northern

communities at risk of flooding, with the improvement of impact-based their understanding of the scientific information forecasting science and through engagement with communities around project worked on ensuring timely access to relevant information for Building on the FATHUM project's results in Uganda, the NIMFRU

> through the National–Scale Impact–Based enhance evidence-based action for floods Forecasting Flood Risk project in Uganda Bringing together experts at every level to

#### ACTION

genuine co-production of potential solutions. involved critical discussions on why weather warnings received through communities meet with staff from the Uganda National Meteorologica. better understand the impacts of flooding on local livelihoods, thereby national media were not always accurate or useful to farmers and led to events and explore how new science may support farmers. These meeting Authority (UNMA) and local Agricultural Extension services. In these Farmer Agri-met Village Advisory Clinics (FAMVACS) - local events where co-producing new insights for impact-based forecasting. Activities included The project partners of NIMFRU engaged directly with communities to meetings, participants share traditional systems for anticipating weather

support services in the district. FAMVACS showed women have difficulty accessing information and when women generally would be free, as the initial results from the key to the success of the radio programmes was to schedule this at times people could phone in and talk to weather- and agriculture experts live. The The Farmers Voice Radio programmes took these interactions further, as

#### NIMFRU Project | Walker Institute Additional information:

A step by step guide to using RAINWATCH, version 1.0 | Zenodo FAMVAC and Listening Group Facilitation Handbool Assessing Livelihood Vulnerability to Extreme Shocks (ALiVE) Foundation | Walker earning to Co-Produce | Walker Academy NIMFRU News: Katakwi Interviews begin | Walker Institute NIMFRU News: Improving Flood Resilience in Uganda | Walker Instit

#### **IMPAC**

implementation for FA MVAC-type exchange groups. initiatives helped them understand how to engage in co-production. and communicate impact-focussed warning messages. The project stations in local languages. For the UNMA experts participating, the would be valuable to extend the radio programme to other local radic forecasts signal a risk of flooding. The overall finding was that it up the rehabilitation of lands after flooding, and farmers have a tangible local changes: the district now owns several tractors to speed initiatives were greatly appreciated by communities, as they felt has led to the production of a handbook on the principles and better understanding of practical action to take when weather listened to by experts. At the same time, the interactions supported the rural areas of Katakwi District (42% of the population). The programmes (20 individual episodes) reached 67,000 people across The engagement through the FAMVACS and the Farmers Voice Radic

assessment, which were key learnings from NIMFRU. The outcomes explicitly recognizes gender and technology as vital areas for approaches, such as the FAMIVACS. The Climate Change Act now also capacity assessments as they seek to scale out the consultation Change Act, advocating for more district-level vulnerability and support preparedness and recovery. livelihood impacts, to improve communication and ultimately importance of ongoing work to better link flood forecasts to local partner CAN<mark>-U,</mark> in their engagement with the Uganda Climate presented to the Parliamentary Committee on Climate Change and from the FAMVACS and radio programmes also confirmed the Environment. The positive experience resonates through the work of The results from the FAMVACS and radio programmes were

UKRI National-scale Impact-based Forecasting of flood risk in Uganda (NIMFRU) NIMFRU Partners project website Minimising flood impacts in Uganda: NIMFRU project update | Evidence for Developme

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