Global Risk Financing Facility
Technical Talks

Session 6:
The Challenge Fund:
Innovations in Risk Financing

12 January 2022 | 08:00 AM – 9:00AM EST
About the Webinars

**WEBINARS**
A series of webinars starting in May focusing on GRiF overview and country projects.

**KNOWLEDGE PRODUCTS**
Webinars are accompanied by knowledge materials, including Learning Briefs.

**AUDIENCE POLLS**
Live audience polls & interactivities: Please participate.

**QUESTION & ANSWERS**
Thank you for sharing questions with your registration. If you have more, please use chat box.
Structure of Webinars

- Introduction & Opening Remarks
- Lightning Presentations
- Technical Conversation
- Closing Remarks, Question & Answer (use chat)
Opening Remarks

Nicola Ranger

Head of Climate and Environmental Risk Research
Oxford Sustainable Finance Group of the Smith School of Enterprise and the Environment, University of Oxford
Opening Remarks

Rashmin Gunasekera
Senior Disaster Risk Management Specialist, GFDRR, World Bank Group (WBG)
Forecast-based Financing for Food Security
- F4S -

Gabriela Nobre, Vrije Universiteit Amsterdam
To support early action that can reduce the risk of food insecurity

Forecasting
Local Context
Benefits Early Action

Our interdisciplinary F4S approach
Household Survey & Choice Experiment

Household questionnaire → Local knowledge → Early warning indicators of food insecurity + Actions taken to lessen the risk of food insecurity

Choice Experiment → Participatory design → People’s expenditure decisions + Collectively design ex-ante cash programmes

Share of cash transfer spent

A. Kenya

- Food expenditures
- Mitigative expenditures
- Household expenditures

- Small sums
- Lump sum

Global Risk Financing Facility

Supporting Early Action to Climate Shocks, Disasters, and Ores
Modelling key drivers of food insecurity

MAIN FINDINGS

➢ Our models predict indicators of food insecurity:
  o Up to 3 months ahead: calories shortage for all agricultural and agro-pastoral regions
  o Up to 4 months ahead: forage scarcity for the pastoralist districts in Kenya
  o Up to 1 year ahead: transitions in the state of the food security in Ethiopia
Cost-benefit and effectiveness

Cost-effectiveness of ex-ante cash transfer

Understanding the benefits of acting early (both socially and economically) based on early information

Each 1 Ksh invested in early action yields 3.6 Ksh in benefits

Improved body condition during drought + Increased milk production

+ Reduction in costs
Key Messages

- Weather-related hazards often lead communities to implement negative coping strategies. However, forecast information is often trusted by them.
- By including local knowledge, we can produce accurate forecasts of key indicators of food security long ahead of a shock
  ✓ Trust + lead time = window of opportunity for implementing anticipatory action.
- The design of ex-ante cash aid affects people’s expenditure
  ✓ Importance of co-designing strategies between institutions and beneficiaries.
- Despite saving lives and creating a range of additional benefits, early cash transfers can be a cost-effective solution.

Contact: g.guimaraesnobre@vu.nl
InaSAFE FBA: A prototype forecast based action platform for Indonesia

Supported by:

Tim Sutton, Co-Founder Kartoza
What if we could *ANTICIPATE* disasters and act before they arrive?

Mobilising people, equipment and supplies before the disaster arrives can substantially reduce the impact of disasters.
The number of vulnerable buildings determines whether action is triggered.

- **Past**:
  - NO ACTION
  - PRE-ACTIVATE
  - ACTIVATE

- **Future**:
  - NO ACTION
  - PRE-ACTIVATE
  - ACTIVATE

20% of vulnerable buildings affected = activation threshold

Trigger statuses tell us where it is time to act, to prepare or to take no special action. This website uses the following colour coding to indicate trigger statuses:

- **All clear**: No action is needed right now but be aware that there is a flood in progress.
- **Pre-Activation**: There is a flood forecast that looks like it will have a significant impact, but it is still a few days away. Be prepared to act!
- **Activation**: There is a flood forecast for a flood within the next 3 days that looks like it will have a significant impact. Mobilise your resources!

*Note: This is forecast information, the final decision about actions is taken by Red Cross teams.*
Lesson Learned

An important outcome of this project has been the development of the methodology to quickly on-ramp a new geographical area. To do this we follow a ‘good, better, best’ approach as shown in the diagram above. It is clear that obtaining institutional data, even with partnerships and buy-in as we had on this project can be a time consuming process in many communities.
SMART
a Statistical Machine learning framework for parametric Risk Transfer

Mario Martina
Hydrology Professor, University School for Advanced Studies IUSS Pavia
Project Objectives

• Develop an innovative framework for the design of parametric triggers for weather index insurance, based on machine learning methods.

• Demonstrate the framework and its pathway to operationalization in a pilot study of multiple hazards in the Dominican Republic.

• Special focus on the agricultural sector, which tends to be severely affected by natural hazards.
ML in the context of index insurance

1. **Identification** of extreme events (e.g. drought, floods)  
   \([\text{Classification}]\)

2. **Prediction** of yield (e.g. milk production)  
   \([\text{Regression}]\)
Event identification

Promising results compared to more traditional modelling approaches for index insurance

Model Precision: 57%

Model Precision: 95%
Yield prediction

• Prediction on Dominican Republic milk production for 2015.

• The model is able to accurately reproduce the trend of milk production up to 12 months.

• Accuracy could be improved even further with additional local data.
Challenges

• Conundrum of using Machine Learning in **data-scarce context**.
• Developing parametric triggers adapted to the local context and that match the actual needs of potential users. Open questions:
  ✓ Should coverage be individual or collective? This has a significant impact on how the model is structured in terms of spatial scale.
  ✓ Which events should be covered? For event classification we used international databases to define floods and drought periods, but these may not have necessarily affected farmers.
  ✓ Environmental variables do not appear to play a significant role in milk production, as inter-annual variability is low. Is this the case in reality? Is there demand for insurance to cover reductions in milk production?
Technical Conversation & Interview

**Guest Speakers**

**Mario Martina**  
Hydrology Professor, University School for Advanced Studies IUSS Pavia

**Tim Sutton**  
Co-Founder, Kartoza

**Gabriela Guimarães Nobre**  
Anticipatory Action Specialist, World Food Programme and Research Associate, Free University Amsterdam

**Interviewer**

**Benedikt Signer**  
Senior Financial Sector Specialist, Crisis and Disaster Risk Finance, World Bank Group
Q&A

Please share your questions in the chat box.

If possible, please indicate to which speaker(s) you would like to address your question(s).

Scan the QR code to join the Disaster Risk Finance Community!
WRAP UP

Stay tuned
Forthcoming technical talks

Learning Brief
With key takeaways coming soon.

Materials from previous talks
Available on event page.

Thank you for attending!