

# International Conference on Inclusive Insurance 2020 – Digital Edition

3 November 2020 – Day 2:

UTC+1 16:00-17:30 – Session 7:

Hosted by CEAR

Inclusive Insurance against climate risks

Quality Index Insurance Certification (QUIIC)



**SPEAKER**

**Michael Carter**

Professor, University of California, MRR Innovation Lab, United States



**SPEAKER**

**Hassan Bashir**

Executive Director, AIID, Kenya



**SPEAKER**

**Lillian Ndungu**

Thematic Lead – Agriculture and Food Security, RCMRD, Kenya



**SPEAKER**

**Munyaradzi Daka**

Uganda Agro Insurance Consortium, Uganda



**FACILITATOR**

**Glenn Harrison**

C.V. Starr Chair of Risk Management & Insurance, CEAR and GSU, United States

🎧 This session is being recorded and will be made available after the conclusion of the conference. 🎧

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## Housekeeping Items

- ✓ Today's **ICII session** is scheduled to last **90 minutes** including Q&A
- ✓ To ensure the highest quality of experience **participants will be muted**
- ✓ **QUESTIONS can be submitted via the Q & A feature** => selection will be chosen by facilitator during the session
- ✓ This session is being **recorded** and will be made available **online**



# Quality Index Insurance Certification (QUIIC)

International Conference on Inclusive Insurance 2020 – Digital Edition:  
Panel discussion hosted by the Center for the Economic Analysis of Risk (CEAR)  
at Georgia State University



[quiic.ucdavis.edu](http://quiic.ucdavis.edu)

## Welcome

Glenn Harrison  
*Georgia State University*



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# Objectives and Overview

- How do we evaluate and “certify” the quality of index insurance contracts?
- QUIIC is a rigorously-motivated policy exercise in applied welfare economics
- For governments and regulators that care about more than just solvency issues
  
- Plan for session
  - **Michael Carter** – Professor, University of California, MRR Innovation Lab, **USA** [20 minutes]
  - **Lilian Ndungu** – Thematic Lead, Agriculture and Food Security, Regional Centre for Mapping of Resources for Development, **Kenya** [10 minutes]
  - **Hassan Bashir** – Executive Director, Agency for Inclusive Insurance Development, Nairobi, **Kenya** [10 minutes]
  - **Munyaradzi Daka** – **Uganda** Agro Insurance Consortium [10 minutes]
  
  - Q&A [30 minutes]

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## The Why & How of Measuring Index Insurance Quality

Michael R Carter, University of California, Davis & BASIS Markets, Risk &  
Resilience Innovation Lab



# Good News, Bad News on Index Insurance

- *Good news* about Index Insurance is that it does not pay based on (verified) individual losses, but instead pays based on a cheap-to-measure 'index' that is correlated with individual losses (e.g., average yields in a zone, or rainfall)
  - Opens the way to offering insurance to low wealth people (especially farmers) who are made and kept poor by risk
  - Evidence shows that index insurance can work and that it allows insured farmers to prudentially invest more and increase incomes by as much as 25%
- *Bad news* about Index Insurance is that it does not pay based on (verified) individual losses, but instead pays based on a cheap-to-measure 'index' that is correlated with individual losses
  - Opens the door to *false negatives*
    - A farmer who truly has a loss that is not due to negligence is not compensated
    - As Daniel Clarke puts it, “the worst thing that can happen to you gets worse when you have index insurance”
  - Opens the door to *false positives*
    - It can also pay farmers when they have not had a loss
    - Paying more than a dollar to get one dollar back when you are in need is not good
    - A surprising fraction of the total premium of index contracts goes to cover false positives
- Plentiful examples of index insurance failures that hurt farmers & damaged the industry

# Certification when Quality is a Hidden Trait

- The quality of many goods and services is a *hidden* trait
  - A farmer holding a maize seed cannot discern its hidden genetic potential
  - The woman holding her insurance contract cannot infer its rate of false negatives
- Certification and, or regulation is the usual response to hidden quality
  - In the case of maize seeds, governments routinely certify quality in terms of:
    - Germination tests
    - Yields
  - If certification is not done (or reliably implemented), the bad drives out the good
    - See this with the case of counterfeit seeds
    - Productivity plummets, economic costs are high
  - While seed certification is usually a government regulation, also have voluntary certifications:
    - ISO standards
    - Underwriter Labs for electric appliances
    - Organic or fair trade for agricultural; commodities
    - ISO standards for various processes
  - Market values and firms pay for these voluntary certifications
- So what are the equivalents of seed germination and yields for index insurance?
  - Economics to the rescue! (Really)

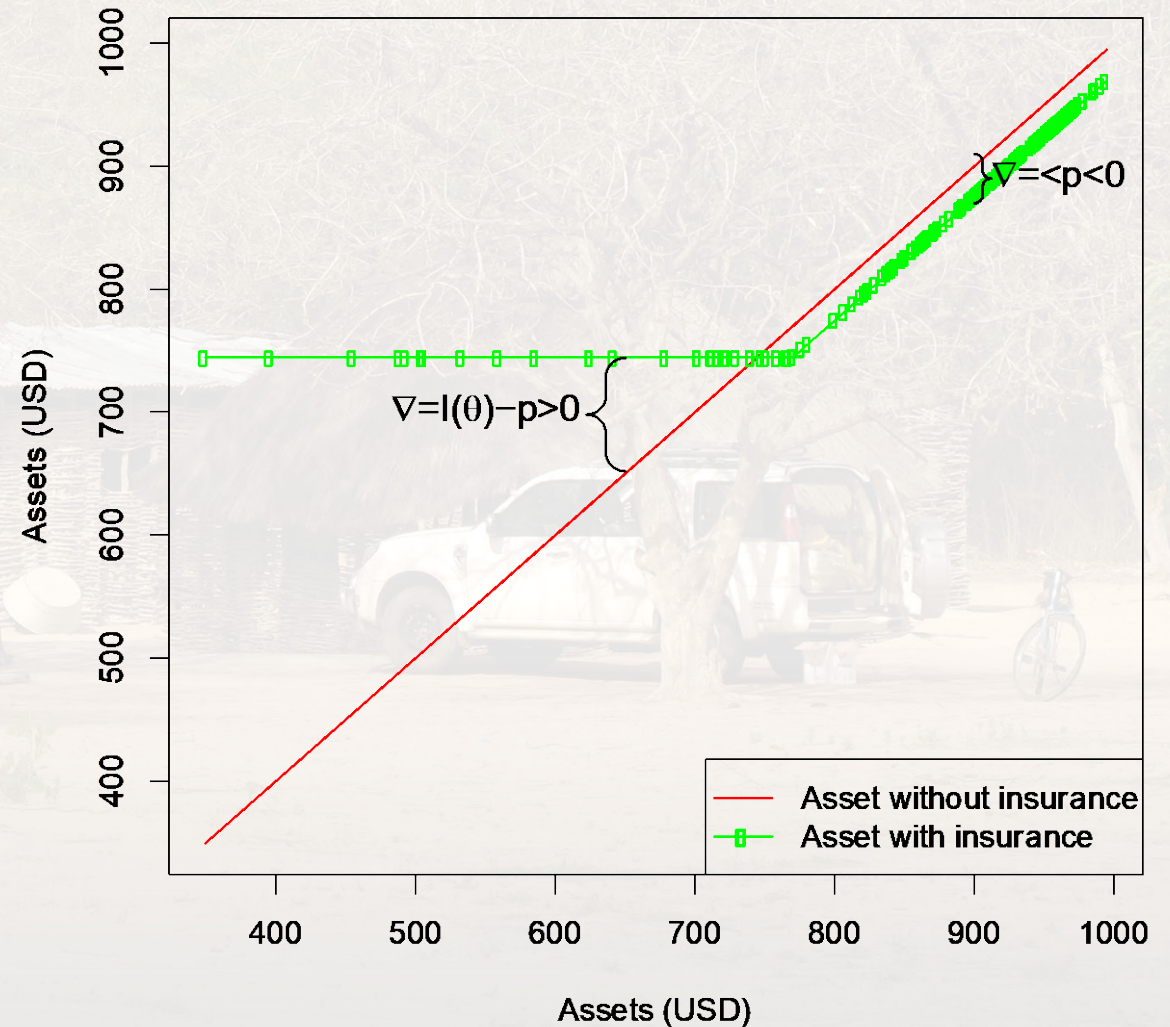


# Index Insurance Quality Metrics

- We know what good insurance looks like:
- In this example, based on actual data for a Kenyan pastoralist family, perfect livestock insurance puts a protective floor under the family—their productive wealth with insurance cannot fall below the floor
- The family will give up some wealth in good years (when money is relatively plentiful) in order get money back in bad years when money is scarce and ‘worth’ more
- The standard economic welfare measure of “expected utility” can be used to determine the benefit or economic value of insurance:

$$IB = EU^I - EU^N$$

- $IB < 0$  means insurance makes people worse off!

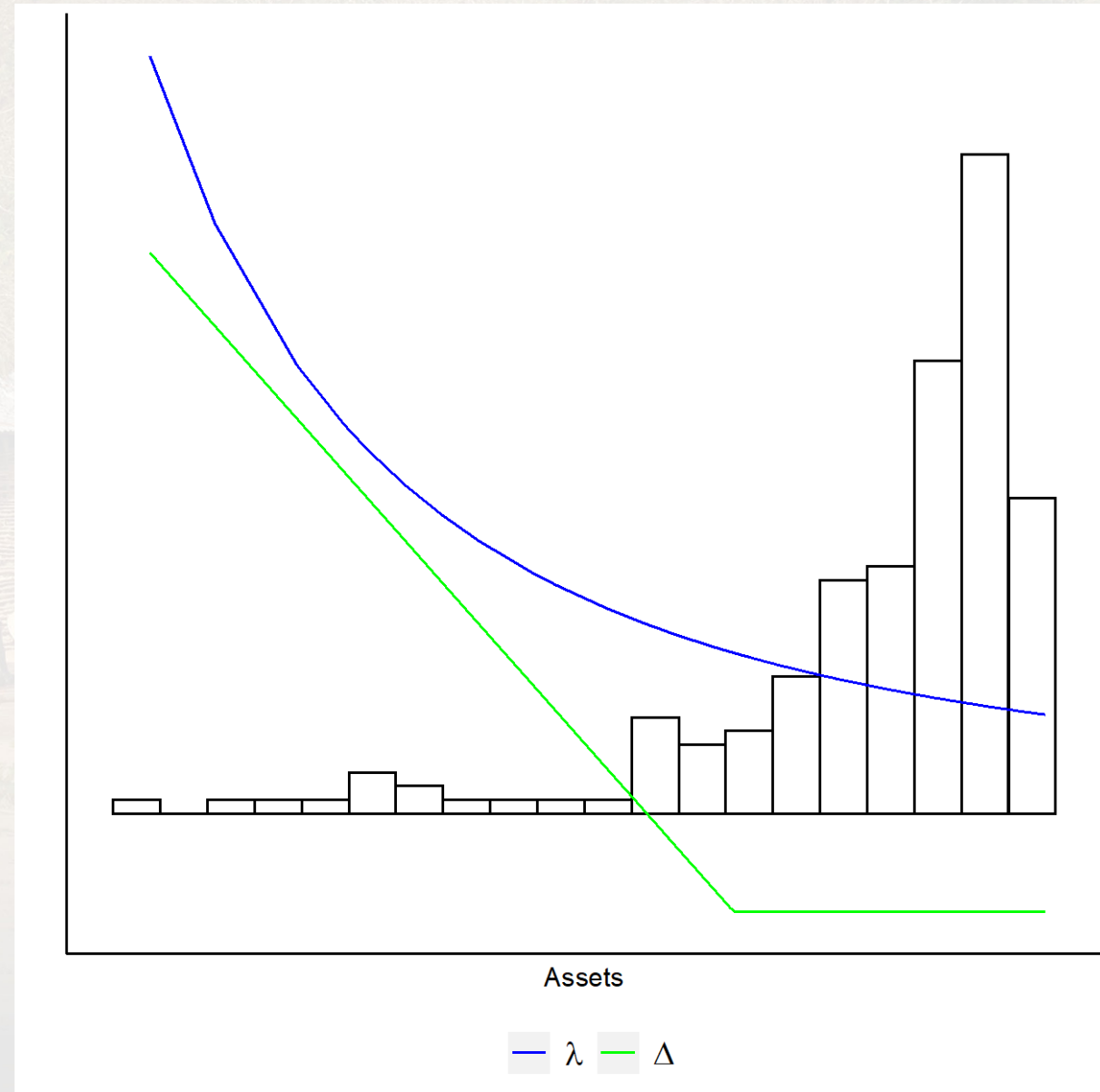




# Index Insurance Quality Metrics

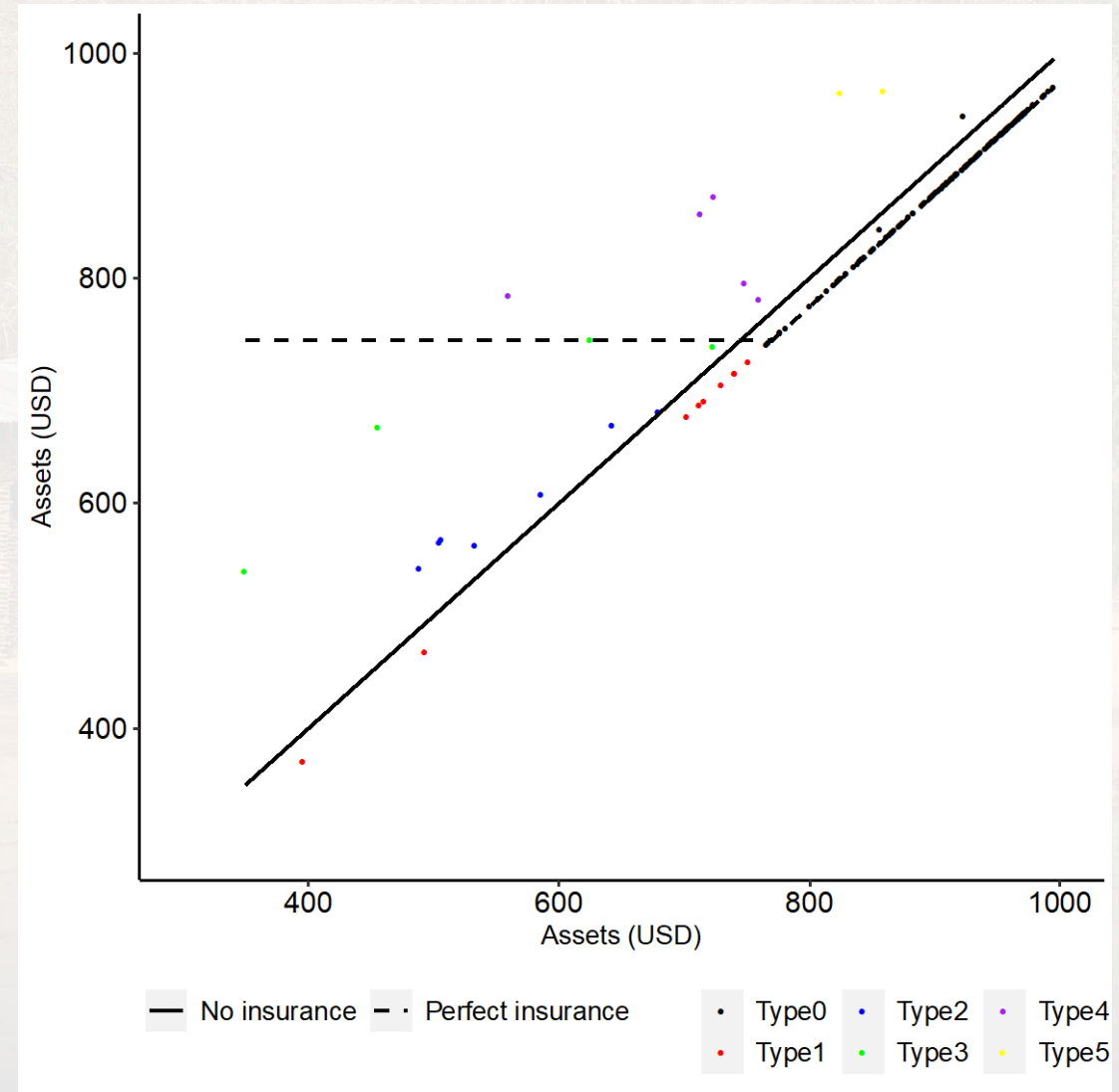
- While that expression appears rather obscure, this metric can be rewritten to show that it is the sum of three sensible things multiplied together:
  - The difference between wealth with and without insurance under each possible outcome (or state of the world)  $j$ :  $\Delta_j$
  - The probability that state of the world occurs:  $\pi_j$
  - The implicit value of money (or level of family desperation) in each state of the world:  $\lambda_j$
- More formally, but perhaps no less obscurely, the economic value of insurance can be written as the following sum across all  $J$  possible outcomes:

$$\Delta_1 \times \pi_1 \times \lambda_1 + \Delta_2 \times \pi_2 \times \lambda_2 + \dots + \Delta_J \times \pi_J \times \lambda_J$$



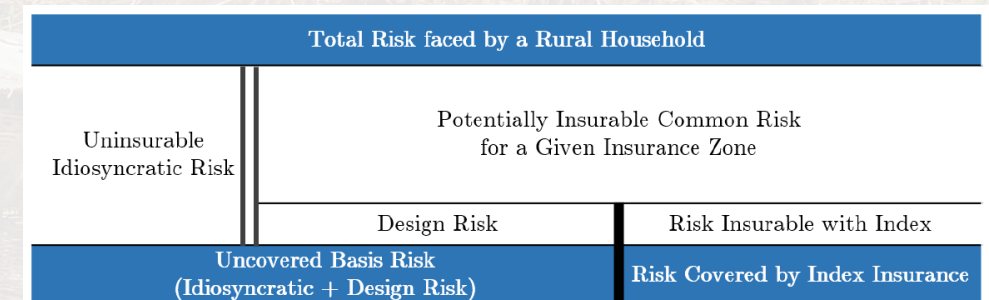
# Using Quality Metrics to Value Index Contracts

- Here is an example of an actual insurance contract based on satellite measures of forage availability that can predict livestock mortality for that Kenyan pastoralist family
- The dots represent the payoffs that would have occurred had this contract been in effect
- Can see that it falls well short of the perfect insurance contract, but it does recoup just over half of the insurance value of the perfect contract:
  - Green dots are instances when the contract worked tolerably well
  - Red dots are bad false negatives, while yellow dots are bad false positives
- Other contracts (e.g., based on rainfall) offer no insurance value!



# From Quality Measurement to Quality Improvement

- Measurement opens the doors to two things:
  - *Do No Harm:*
    - Get rid of contracts that offer no insurance value and make people worse off
  - *Design for Quality:*
    - *Eliminate design risk*, meaning improve the ability of contracts to predict average losses within an insurance zone
    - *Reduce Idiosyncratic risk*, meaning use technology to make insurance zones smaller so that there is less individual, idiosyncratic variation around the average loss
- Perhaps we can return to questions on quality, but let's turn now to our next panelist who will tell us more about the actual QUIIC quality certification process



# For more information

- Benami, Jin, Carter, Ghosh, Hijmans, Hobbs, Kenduiywo & Lobell. “Uniting Advances in Remote Sensing: Crop Modeling & Economics for Agricultural Risk Management,” *Nature Reviews: Earth & Environment*, 2020.
- Carter & Chiu. “Quality Standards for Agricultural Index Insurance: An Agenda for Action,” in *State of Microinsurance*, 4 (Microinsurance Network), 2018.
- Kenduiywo, Carter, Hijmans & Ghosh. “Evaluating the Quality of Remote Sensing Products for Agricultural Index Insurance, 2020.

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## Regional Collaboration for QUIIC Implementation

Presenter: Lilian Ndungu





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## *Our Vision*

*To be a premier Centre of Excellence in provision of Geo-Information services*

## *Our Mission*

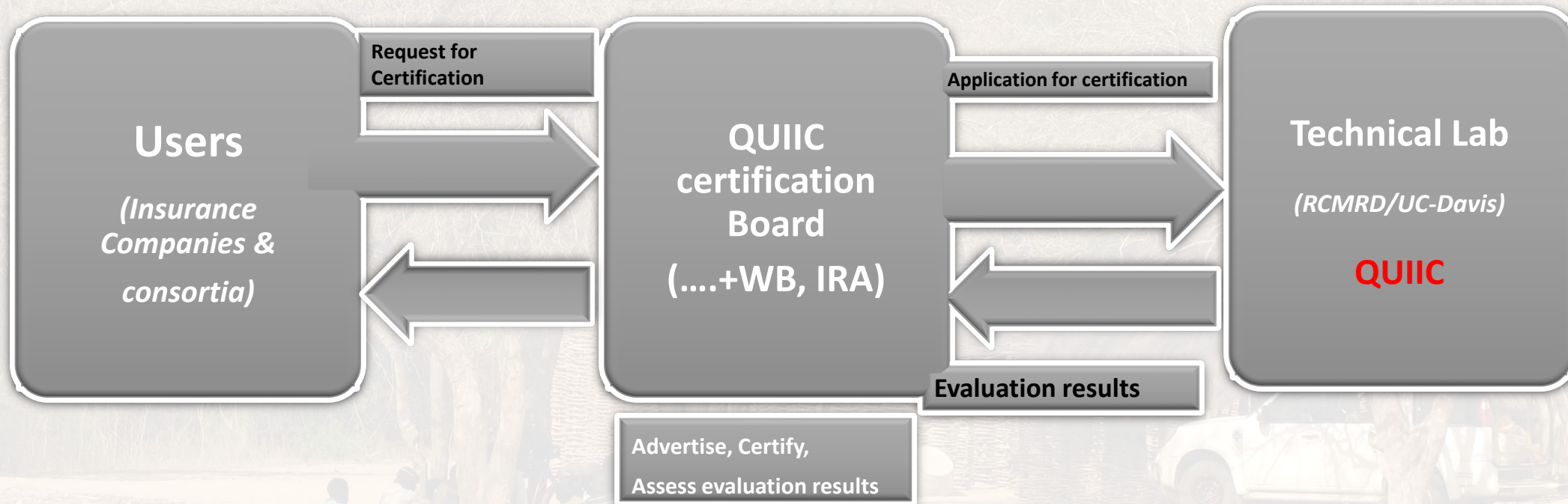
*To promote sustainable development through generation, application & dissemination of Geo-Information and allied ICT services and products in the Member States & beyond*



## RCMRD for QUIC

- Existing linkages with insurance programs
- EO Technical expertise, data tools, products, advisory
- Affiliations & Partnerships
- Data repositories
- Neutrality/Non partisan
- Scale- support for insurance products in Africa
- Coordination
- Capacity building

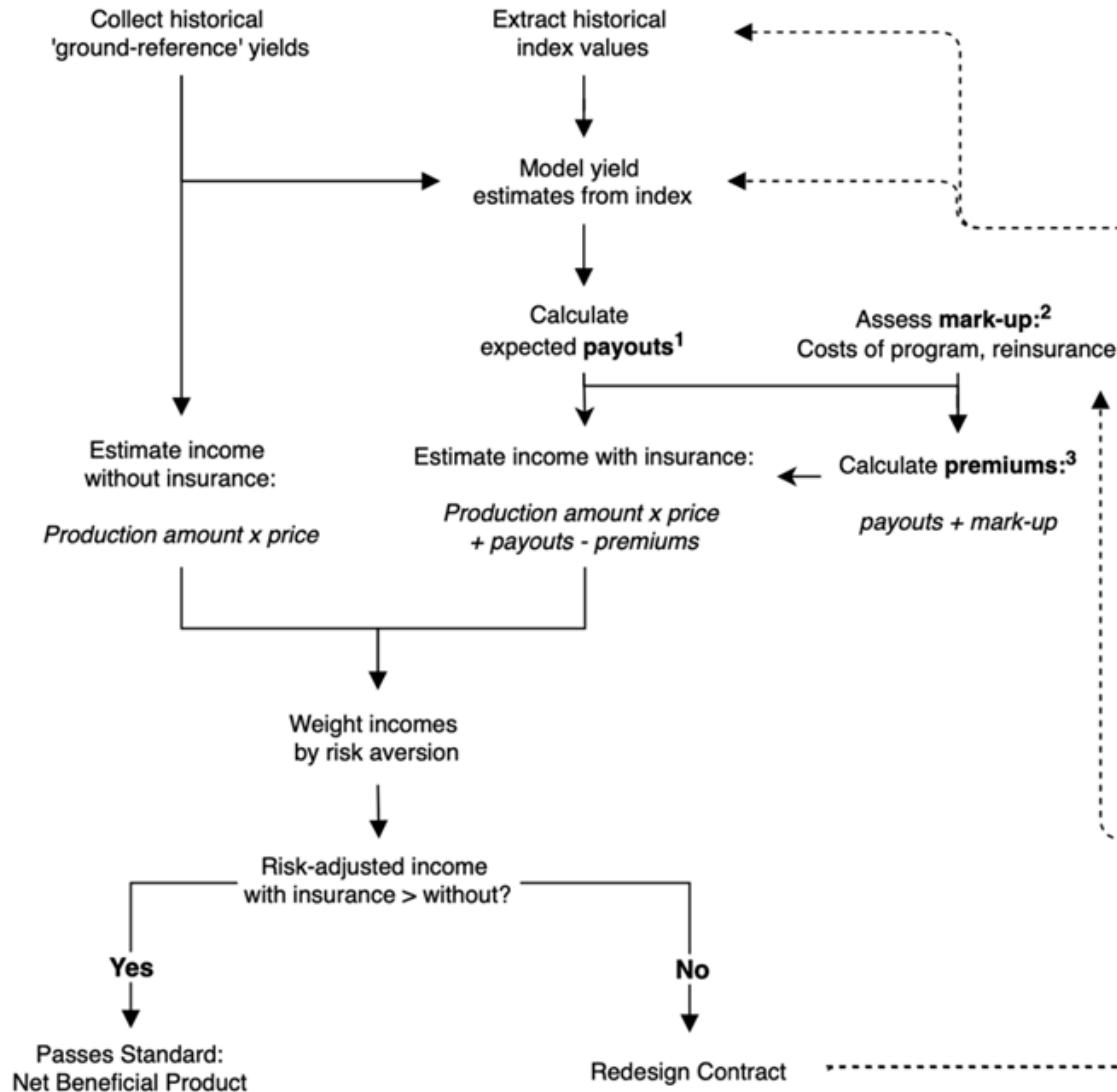
# QUIIC Certification Process



A **working group** consisting of all necessary stakeholders from insurance companies and consortia, regulatory authorities, government, re-insurance and international representatives will be involved and consulted in the development and implementation of the QUIIC pilots.

# Contract Evaluation Process

## Process to evaluate & improve the design of an index insurance contract



### Opportunities for improved crop modeling, yield prediction, and program design to enhance quality

**Enhance Contract Design**

- Use alternative indices, drawing upon crop models and data that better capture crop growth, loss, and failure
- Reduce idiosyncratic risk, e.g. within-insurance zone variation, possibly by forming different insurance zones.
- For satellite based indices, enhance signal-to-noise ratio: employ crop masks with finer resolution data
- Consider an audit protocol to address mis-prediction

**Reduce Cost**

- Strategically reduce costly field visits e.g., low-cost phenocams, enhanced field sampling protocols with satellite imagery, conditional audits
- Improve risk quantification e.g., use crop models to generate longer time series for past risk and/or improved projections for future risk



# What's next?

- Strengthen networks and collaborations for data collection/Acquisition
- Capacity building in the region on risk financing and remote sensing
- Market level study on the effectiveness of the QUIIC certification
- Scaling implementation of the QUIIC in the RCMRD member states

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Dr. Hassan Bashir  
Executive Director, AIID



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# Background – Index Insurance in Kenya

- Introduced in Kenya a decade ago (crop and livestock insurance)
  - Index Based Livestock Insurance (IBLI) for livestock
  - Crop Insurance (MPCI, NPCI, AYII, WII)
- IBLI was designed by ILRI & implemented by the private sector from 2010
- Product design has changed from mortality based to forage scarcity-based product.
- Change in contract design led to improved uptake from 100 policies in 2013 to 10,000 policies in 2015.
- On this success, the Government of Kenya introduced the Kenya Livestock Insurance Program (KLIP) covering 18,020 households.
- 10 years of IBLI implementation in Kenya has contributed to understanding of product and market.
- Product was adopted by other countries such as Ethiopia.

# Perception of Quality

- Product – developed by ILRI with limited industry role in initial design.
- Local industry lacked capacity in the product.
- ILRI provided technical support on contract design and product pricing.
- Channel – industry tried the traditional agency method which failed.
- Community based channel model performed better but was not without challenges.
- Claims trigger was announced by ILRI.
- Claims paid by the insurance industry.
- Service – measured by uptake and claims payment.
- If uptake improved and claims were settled, the product was assumed to meet customer needs.
- No clear measure of customer benefits by service providers.

# Quality Certification - Rationale

- Validates the rigor of contract design process by meeting minimum criteria.
- Validates basis/rationale of product pricing
- Affirms channel quality through agent certification.
- Provides basis for agent training and development.
- Approved certification gives confidence to both industry, channel and market.
- Provides minimum benchmarks for industry to match and exceed.
- Provides a basis for regulatory supervision of the sector.
- Eliminates the reliance on firm-level best-effort as a basis for establishing service.

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## Perspective on Government Implementation and on Quality Issues Existing in Microinsurance

Presenter Munya Daka



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# WHAT IS THE UAIS?

- **Public - Private Partnership**
  - ✓ aimed at mitigating financial losses suffered by farmers due to majority of the natural calamities.
  - ✓ G.o.U provides an insurance premium subsidy to farmers who directly purchase agriculture insurance products and those accessing agriculture financing through financial institutions

# Stakeholders

Committee on  
Agriculture Insurance  
Scheme

Ministry of  
Finance/BOU

Insurance Regulatory  
Authority

Farmers Associations

Service  
Providers/Development  
Partners/NGOs

UIA/Agro Consortium



# Who is the Agro Consortium

- Insurer of the scheme (11 member insurers)
- Consortium administered by a secretariat
- Secretariat acts as liaison between government agencies on behalf of insurers
- Consortium works on co-insurance basis, a pool for the agriculture insurers



# Quality Issues

Local companies anxious to enter into agriculture insurance due to the potential expected incomes but not equipped to handle the complexities of the index products

Lack of data locally to ensure quality products design

Lack of expertise and skills for index product designs

- Leads to low quality products which fail beneficiaries
- Example Eastern region farmers averse to insurance after failed product ,
- 6 years to correct the perception and onboard them again

# Impact on Government Schemes

## Challenge

- Political pressure on premiums and claims a threat in government schemes

## Solution

- A certified product means protection for products against undue influence

Thank You



END





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2 - 6 November 2020  
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