

Platform  
for Agricultural  
Risk Management

Managing risks  
to improve farmers'  
livelihoods

Workshop



# Information Systems for Agricultural Risk Management

Workshop Report

IFAD HQ, Rome - Italy | 31<sup>st</sup> January, 2017

Volume 2

Presentations

**Better information.  
Enhanced risk management.  
More investment in agriculture.**





# Information Systems for Agricultural Risk Management Workshop

## **VOLUME II** **PRESENTATIONS**

IFAD HQ, Rome - Italy | 31st January, 2017

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## TOPIC 1: Holistic IS-ARM at country-level

This group consists of presenters of market, plant/animal health/disease, and forecast/monitoring initiatives from start-ups to high-level institutions. It seeks to enable presenters from different areas of risk themes and at different levels of work to understand one another's work and for the audience to appraise the work of different institutions. It aims at enhancing the possible ways to merge both health/disease issues with market, particularly during monitoring and data management phases of ARM.

Presentation 1.1: Finance, Information & Risk Management Model (FIRM)  
Jaime Ter Linden, Founder, Agri Risk Analyzer

Presentation 1.2: Big Data for Better Livelihood: MUIIS Uganda, CTA  
Benjamin Kwasi Addom, Programme Coordinator, ICT4D, CTA

Presentation 1.3: ICTs in Plantwise: Management of plant health risk, CABI  
Dannie Romney, Program Manager, CABI




## Presentation 1.1:





### Finance, Information & Risk Management Model (FIRM)

Jaime Ter Linden, Founder, Agri Risk Analyzer




### Reasons for Underserving the Sector




	 Financial Institutions	 Insurance companies	 Other service providers	 Extension services
Target group with limited purchasing power	✓	✓✓	✓✓	-
High cost of identifying target group & collecting farmer information	✓✓	✓✓	✓	✓
High marketing & distribution costs	✓✓	✓✓	✓✓	✓✓
Exposure to systematic risks	✓✓	-	-	-
High risk of default / non-payment / fraud	✓✓	✓	✓	-

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### Solution – the FIRM concept




#### FIRM: Finance, Information & Risk Management




**Unlock Access to Finance and other Services by Integrating:**

- Farmers Information
- Risk Profiles & Analysis
- Payment & Transaction Platform



**Take away Barriers for Service Providers by:**

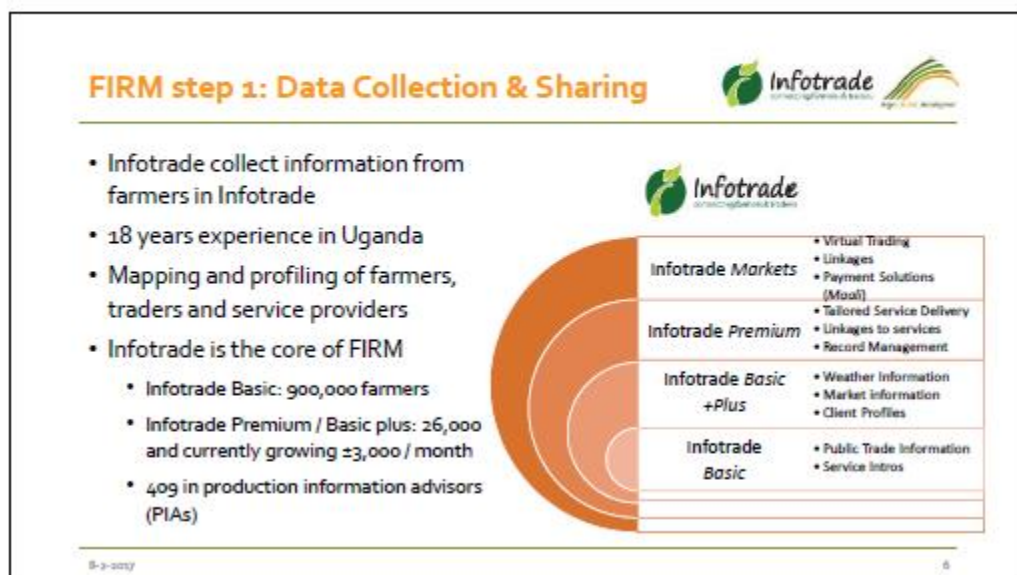
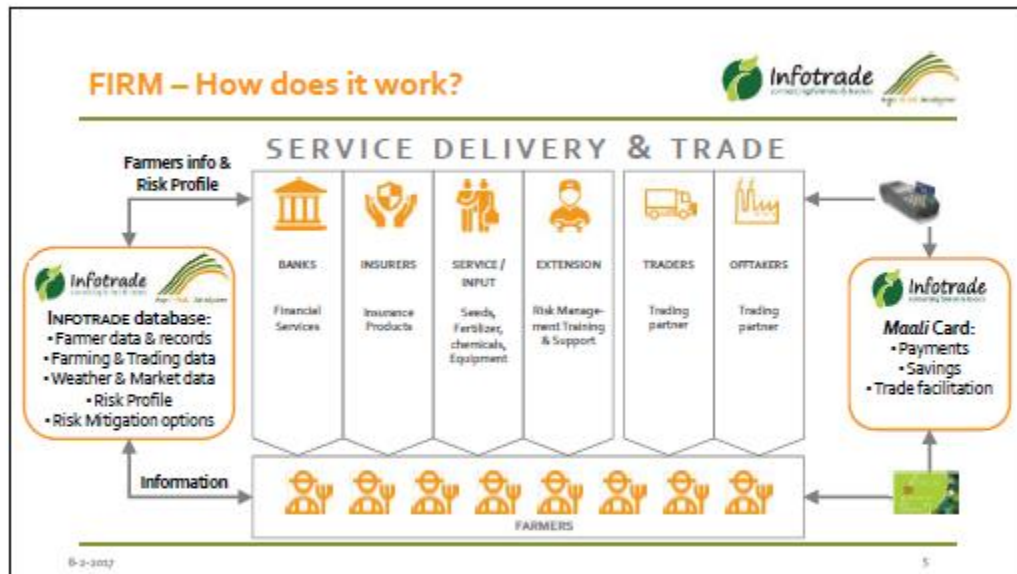
- Provide turn-key farmer profiles
- Provide risk analysis on individual and systematic risks
- Payment & Transaction platform



**Facilitate Risk Insights for Extension & Policy:**

- Aggregated profiles on village, district & national level
- Advice on Risk Mitigation policy & support

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## FIRM step 2: Analytics



The Agri Risk Analyzer will process the data and calculate:

- Risk Information:
  - A risk score (1-5 scale) indicating the farmers' risk exposure
  - A sensitivity analysis providing how risks contributes to the total risk
- Risk Mitigation Advice:
  - An overview (ordering) of most effective and efficient risk mitigation options, like insurance or irrigation
- Credit Score\*:
  - A score based on 'distance to default'



\* Sufficient financial farmer data needed in order to process a credit score

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## FIRM step 3: Sharing Information & Trade



- FARMERS**  
Access to Finance, Market & Extension by Integrating:
- Farming Information
  - Risk Analysis & Advice
  - Debit Card for Transaction
  - Linkage Financial Services
  - Linkage to Risk Solutions



**BANKS, INSURERS, SERVICE PROVIDERS**

**Lower Barriers & Costs:**

- Reduce marketing costs with turn-key population of pre-screened farmers
- Lowering the cost of collecting and analyzing data
- Reduce transaction costs with *Maali* Card
- Risk analysis on individual and systematic risks
- Indication of need for risk mitigation products

- EXTENSION SERVICES, NGO & POLICY**  
**Individual and aggregated risk insights**
- Support Risk Analysis
  - Indicate most effective risk mitigation solutions
  - Aggregated overview of risk issues

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## User Case: Farmers

**1. Access to Information**

- Receive weather and market information
- Get agronomical advice
- Get insight into risk profile
- Know risk mitigation options

**2. Improve Practices**

- Improve agronomical practices
- Get better prices
- Improve risk profile

**3. Link to Service Providers**

- Get access to providers of finance, insurance, services & products, extension
- Further enhance productivity, access to storage, reducing post-harvest losses

**4. Debit Card**

- Store, save, receive, send and spend money electronically with the Maali Card

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## User Case: Financial Institutions

**1. Identify Potential Customers**

- Identify customers in need for financial services
- Identify creditworthy versus non-creditworthy farmers
- Cost reduction for marketing and loan origination

**2. Easy Processing, Better Loan Decisions**

- Transfer turn key data & analytical profile into internal loan process
- Improve accuracy of credit decision based on credit scores

**3. Packaged Loans**

- Based on risk mitigation advice, the loan can be packaged with insurance, or irrigation loans only, for example
- This can significantly reduce the risk for FIs

**4. Easy Processing**

- Distribute loan to Maali Card
- Collect repayment via Maali Card
- Receive transaction based credit information
- Reduce cost on distribution

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## User Case: Insurance Company

**1. Identify Potential Customers**

- Identify farmers who can benefit from insurance
- Cost reduction for marketing and origination

**2. Easy Processing & Better Underwriting Process**

- Transfer turn key data & analytical profile into underwriting process
- Improve accuracy of underwriting process

**3. Easy Processing**

- Distribute insurance and collect payment with Maali Card
- Distribute payouts via Maali Card
- Reduce cost on distribution

**4. Packaged Insurance**

- Package insurance with other products, like loans or inputs
- Increase marketing opportunities

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## User Case: Service / Input provider

**1. Identify Potential Customers**

- Identify farmers who can benefit from service / product
- Reduce cost for marketing

**2. Improved Market Intelligence**

- Quantified insight in how farmers can lower their risk profile with certain products / services (e.g. improved seeds, agronomical practices, irrigation)
- Custom made products & group discounts

**3. Easy Transactions**

- Receive payments with Maali Card
- Reduce cost on distribution

**4. Package with other Products**

- Package own product with other products & services
- Increase marketing opportunities

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## User Case: Extension Services & Policy

Extension		<ol style="list-style-type: none"> <li>1. Understand Risk Profile             <ul style="list-style-type: none"> <li>• Get insight in the risk profile of farmers</li> <li>• Identify training opportunities</li> <li>• Increase effectiveness of programs</li> </ul> </li> </ol>		<ol style="list-style-type: none"> <li>2. Identify Risk Mitigation Options             <ul style="list-style-type: none"> <li>• Identify risk mitigation options with farmers</li> <li>• Integrate in training &amp; capacity building program</li> <li>• Link to providers of services</li> <li>• Improve risk profile of farmers</li> </ul> </li> </ol>
Policy		<ol style="list-style-type: none"> <li>1. Portfolio Overview             <ul style="list-style-type: none"> <li>• Get an overview of farmers, risk and trade on village, district, national level</li> <li>• Identify weak spots in the system</li> </ul> </li> </ol>		<ol style="list-style-type: none"> <li>2. Policy &amp; Support             <ul style="list-style-type: none"> <li>• Improve policies on village, district and national level</li> <li>• Improve risk resilience of farmers</li> <li>• Support public &amp; private sector in service delivery to farmers</li> </ul> </li> </ol>

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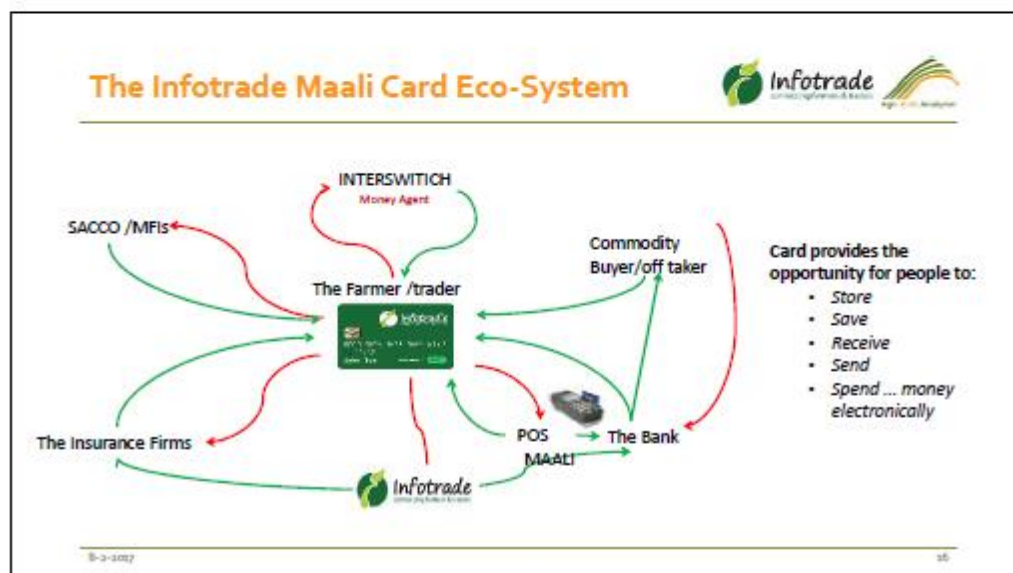
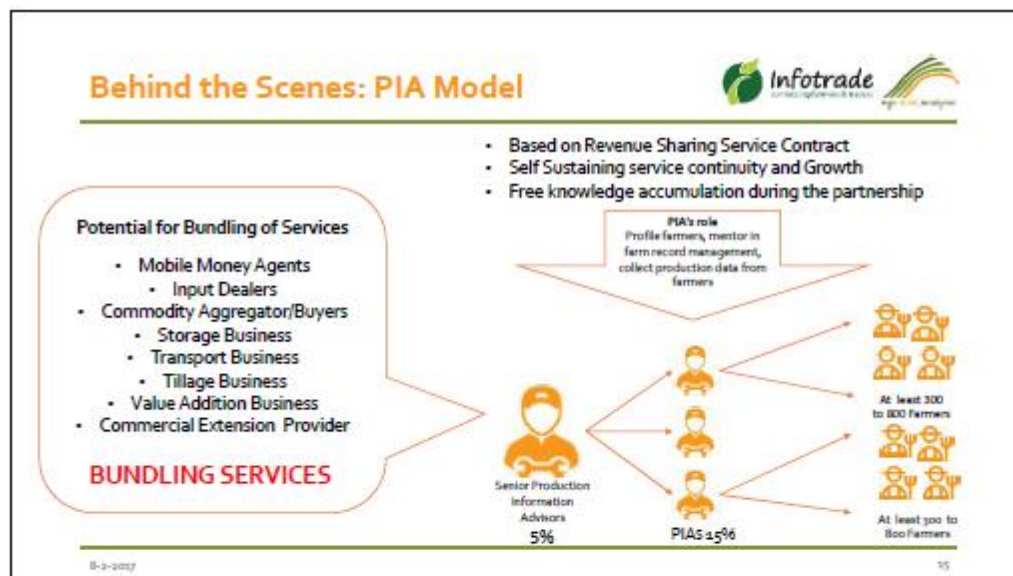
## Business Model

	Farmers	Banks & Insurers	Service / Input Providers	Extension Services
	Annual Subscription USD 10	Pay as you go (pay per view) USD 3-5 per farmer		

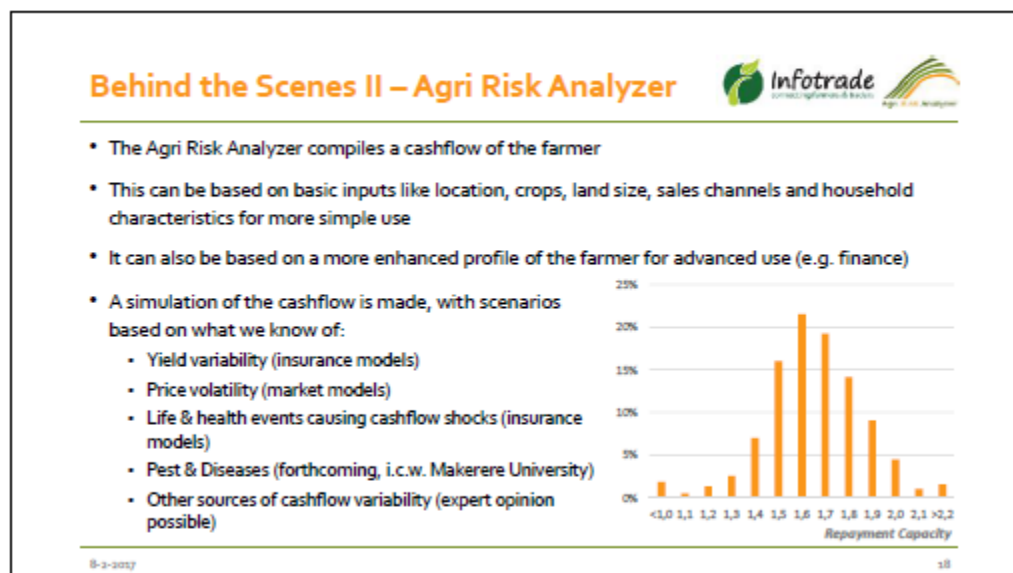
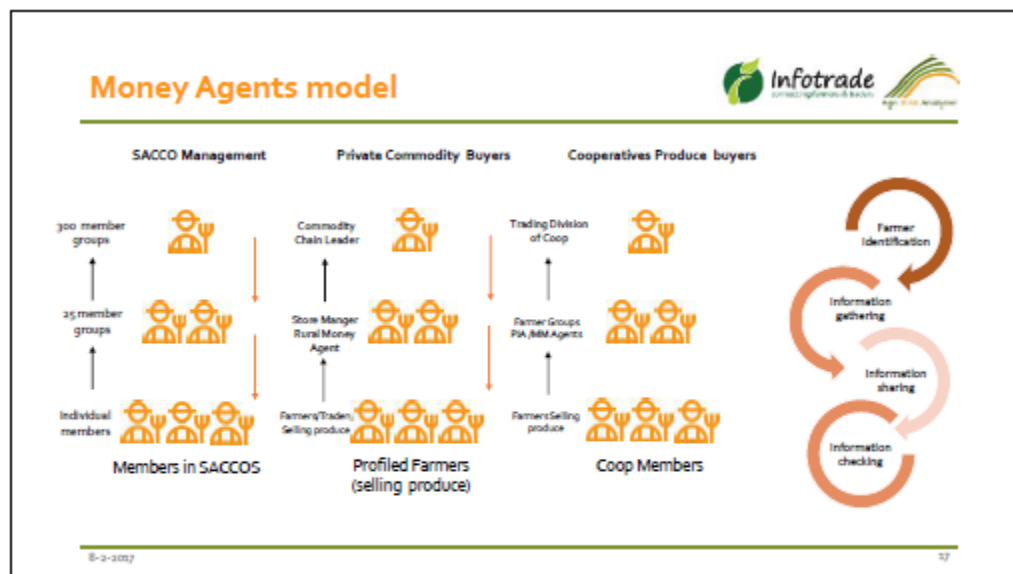
  

	Farmers	Banks & Insurers	Service / Input Providers
	Buy Card for UGX 15,000	Pay as you go 0.5 % of transaction	

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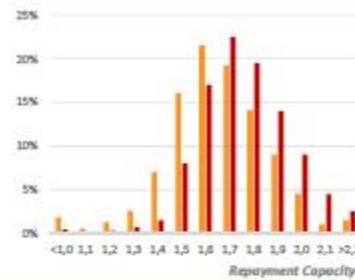




## Behind the Scenes II – Agri Risk Analyzer



- Within this methodology, we can also calculate the effect of risk mitigation
- For example: irrigation
- Irrigation in general delivers higher yields and makes the farmer less vulnerability for drought. This is reflected in the scenarios
- Now we can compare the farmer with irrigation (red bars) and without irrigation (orange bars)
- The difference between these graphs determines whether there is a 'business case' for irrigation
- This is repeated for other risk mitigants (e.g. insurance, improved seeds, agronomical practices, etc)



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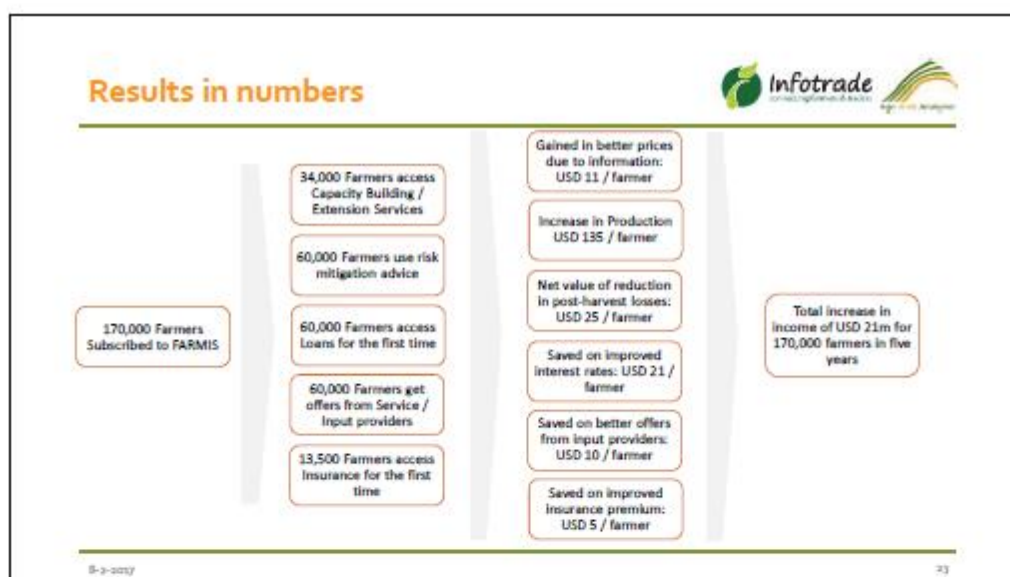
## FIRM Partners



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# Thank You





**FIT Uganda**  
[robert@fituganda.com](mailto:robert@fituganda.com)  
[www.fituganda.com](http://www.fituganda.com)  
[www.infotradeuganda.com](http://www.infotradeuganda.com)  
+256 752 460354  
+256 414 532 393



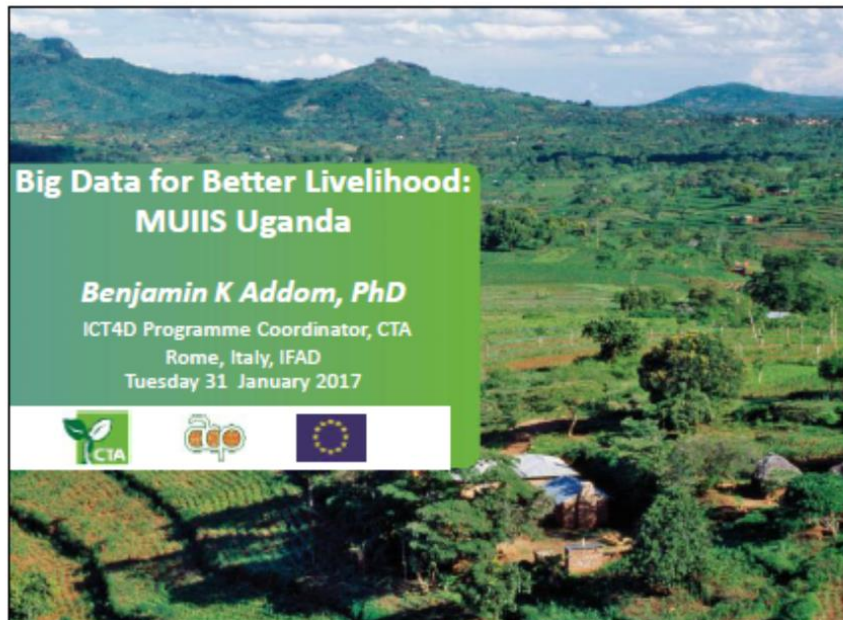
**Agri Risk Analyzer**  
[jaimeterlinden@agriskanalyser.com](mailto:jaimeterlinden@agriskanalyser.com)  
[www.agriskanalyser.com](http://www.agriskanalyser.com)  
+256 781 189 826  
Whatsapp: +31 6 26700893  
Skype: Jaime.ter.linden



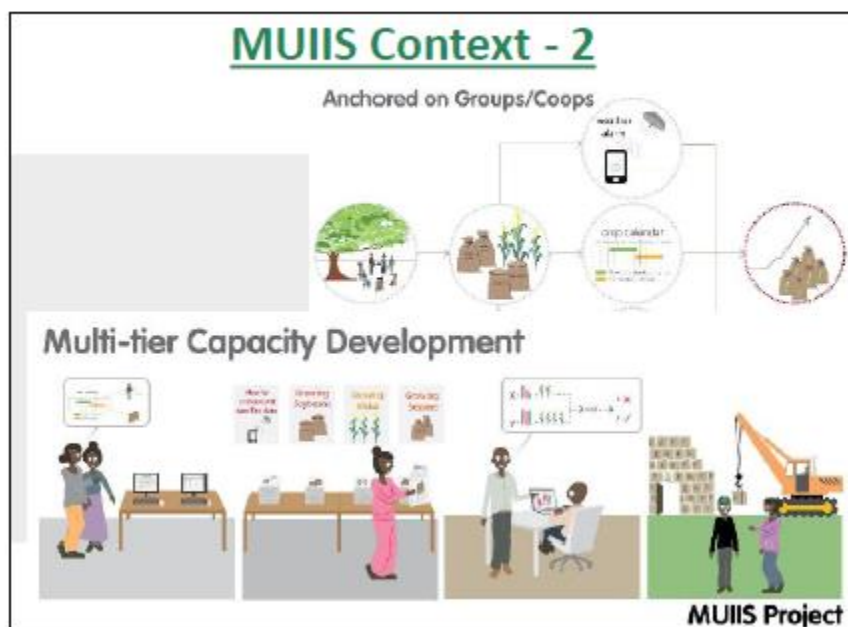
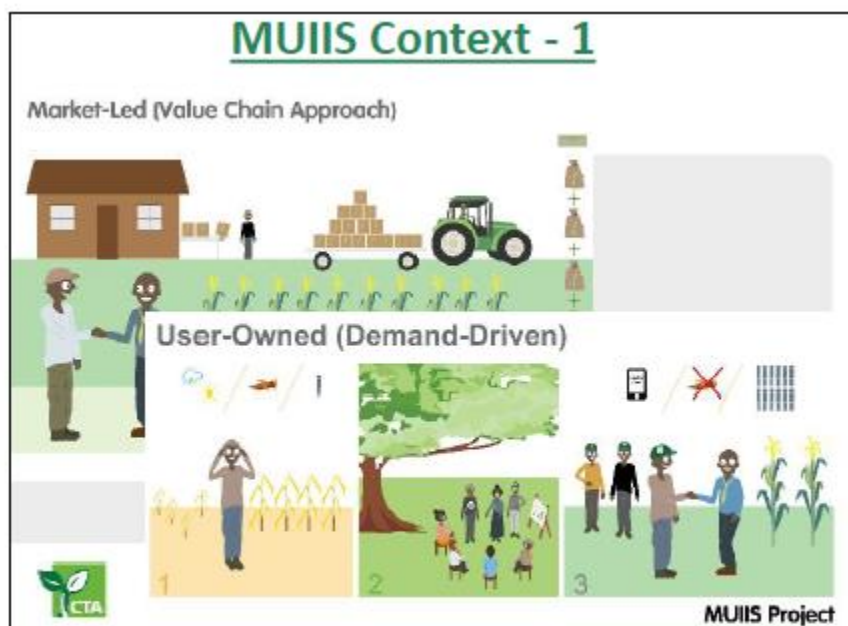
## Presentation 1.2:

### Big Data for Better Livelihood: MUIIS Uganda, CTA

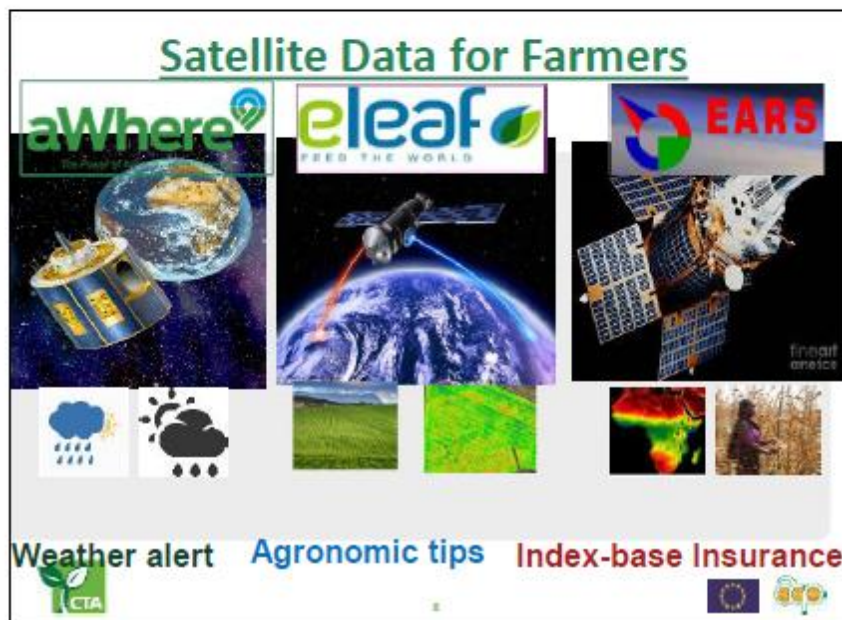
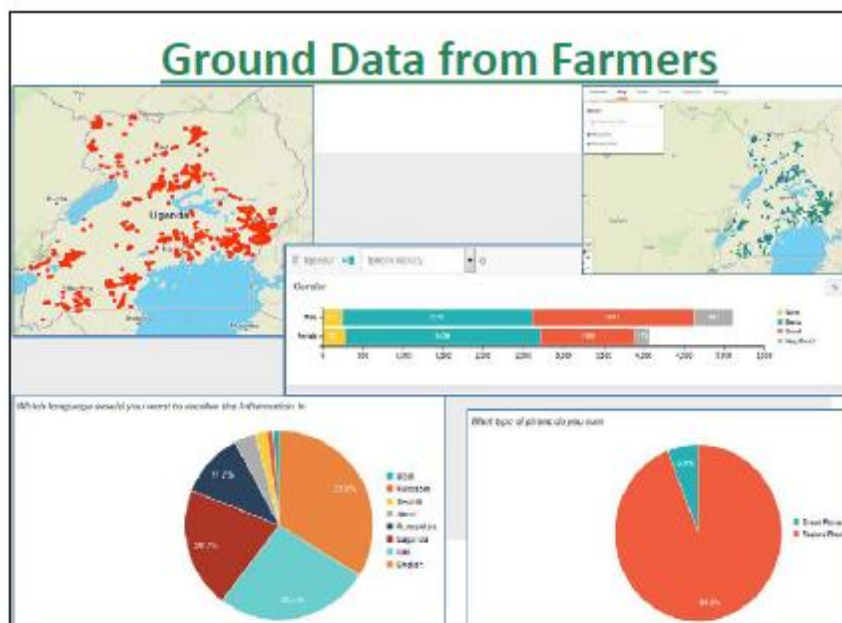
Benjamin Kwasi Addom, Programme Coordinator, ICT4D, CTA













### MUIIS Bundle Products & Services

## MUIIS

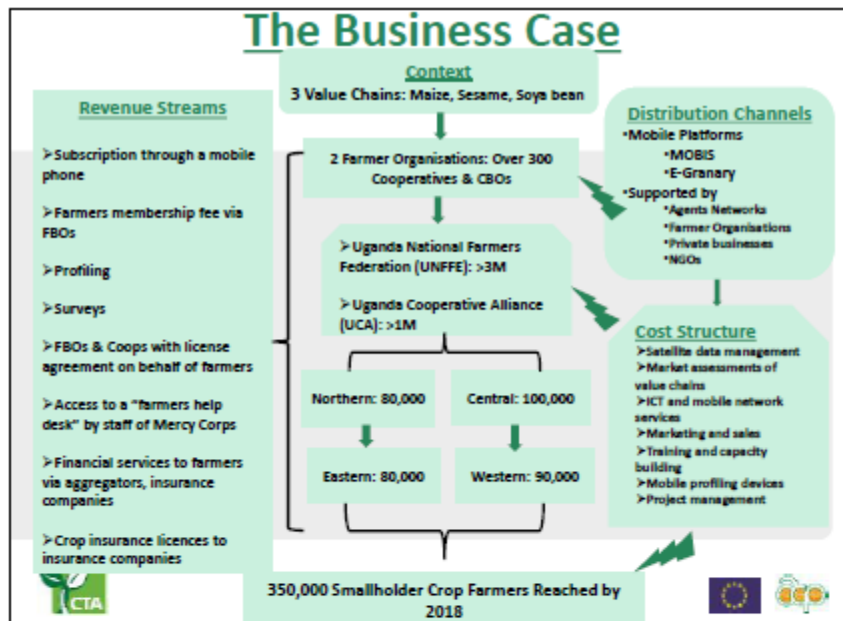
## SERVICE BUNDLE

#### A Farmer Preview

Web products demonstrate good coverage, comprehensive and for the services, they are on the way to be developed and integrated

#### On the inside

The service bundle is designed to be used by the farmer to access the information



## And then what.....?

- ❖ **Farmers will receive timely, accurate and actionable messages**
- ❖ **Farmers will receive training support from MSAs on how to act on these messages**
- ❖ **Leading to:**
  - Better use of seed, fertiliser, agro chemical, etc.
  - Better management of seasonal weather, drought etc.
  - Quicker response to pests and disease outbreaks
  - Better access to input and output market, market intelligence
  - Better access to insurance to cushion climate variability
  - Reliable access to credit and loans
  - Increase productivity and livelihood








## Presentation 1.3:

### ICTs in Plantwise: Management of plant health risk, CABI

Dannie Romney, Program Manager, CABI





### Plantwise

- Networks of plant clinics run by trained plant doctors established (PDs)
- Knowledge bank (KB) of plant health information
- Strengthens plant health system management and data collection

➔

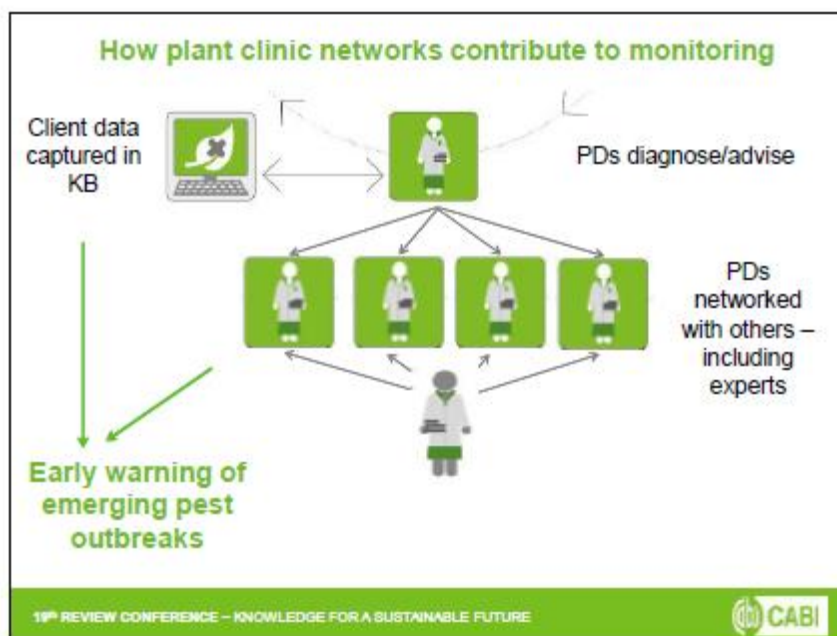
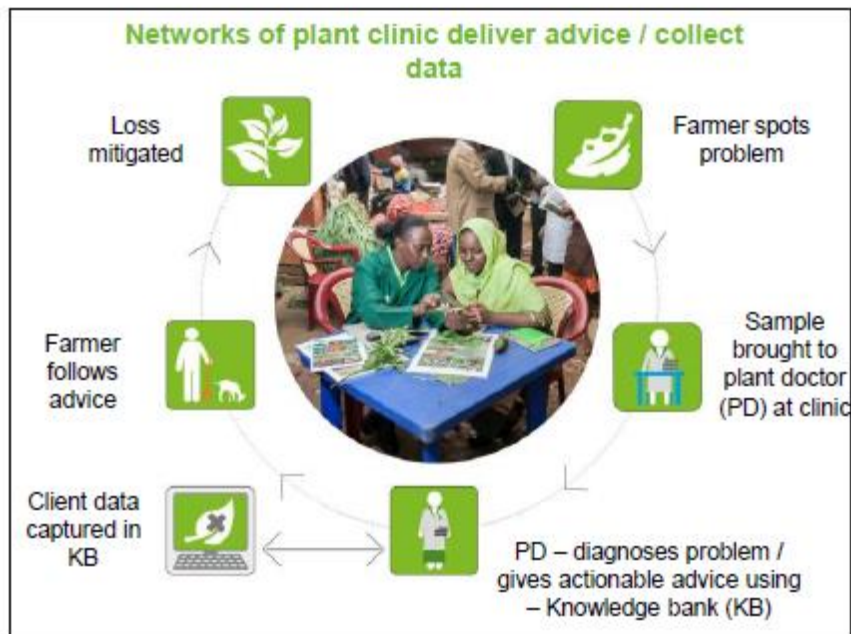
- Pest and disease monitoring
- Improved stakeholder knowledge
- Demand-led advisory systems

➔

- Adoption of new pest management practices
- reduced crop losses,
- improved agricultural productivity

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CABI





## ICTs in Plantwise

1. Providing knowledge
2. Managing data
3. Communicating advice

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## Providing knowledge

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## Online Plantwise Knowledge Bank

- an open access internet resource
- over 10,000 validated, updateable factsheets covering 2,500 crop pests in 80 languages
- links to thousands of external factsheets and videos
- thousands of images to assist with diagnoses
- interactive maps showing pest distribution



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## Online Plantwise Knowledge Bank

- pest alerts to inform of new pest outbreaks
- plant health news from online sources
- custom home pages for all countries, showing only relevant information
- faceted search tool to assist in diagnosis



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## Offline Plantwise Factsheet Library

- USB stick with key information from the Plantwise Knowledge Bank
- designed for offline use



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## Plantwise Factsheet Library app

- available both in Android and iOS
- anyone with a smartphone can download factsheets of relevance to their country
- content can be accessed offline whenever there is no internet connection



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### Educational apps



- Plant Doctor Simulator: to improve extension workers' ability to **diagnose** key pests
- Crop Management Simulator: to improve extension workers' ability to **give suitable** IPM solutions to farmers

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### Monitoring



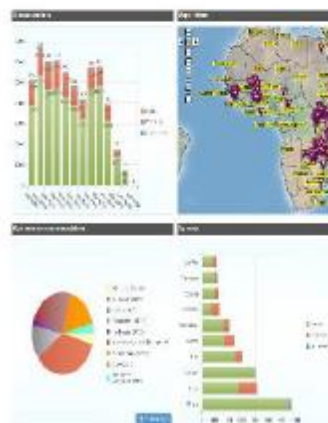
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- available on Android tablets or phones
- allows digitisation of plant clinic data to be carried offline
- **content can be accessed offline** whenever there is no internet connection

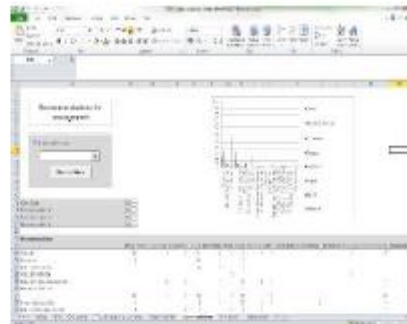


- holds plant clinic data
- facilitates the loading, harmonisation, analysis and downloading of data
- basic analyses by gender, crops and pests
- controlled access for authorised in-country partners to view their own data



## Offline data analysis spreadsheet

- data downloaded from POMS can be manipulated and analysed offline
- built-in algorithms calculate basic statistics for each clinic
- access to the raw data allows users to further customise their own analyses



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## Validation spreadsheet

- allows in-country validators to check the quality and accuracy of plant doctors' diagnoses and recommendations

The screenshot shows a Microsoft Excel spreadsheet titled 'Validation spreadsheet'. It contains a large table with columns for 'Clinic', 'Date', 'Disease', 'Age', 'Sex', 'Status', 'Validator', 'Validation', 'Recommendation', and 'Recommendation Date'. The table is organized into sections for different regions, with each section having its own set of data rows.

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## Networking apps

- plant doctors use WhatsApp, Telegram and Facebook to communicate with one another
- the self-help communities that grow usually include diagnostic experts or plant doctors with access to the Knowledge Bank
- Supports improved diagnosis and early warning

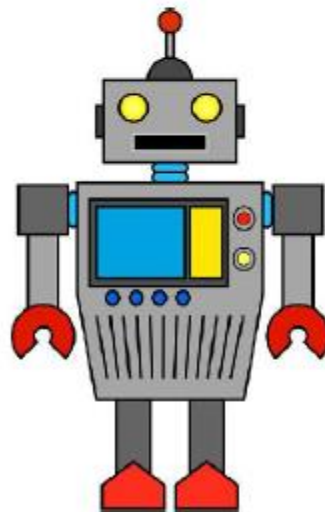


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## Citizen science

- Integration of bots to monitor mentions of crops and pests so that we can look at trends
- Use of bots to carry out polls on pest incidences etc.



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**Mass extension via mobile phone services**

- Plantwise content can be exported to other services that distribute information directly to farmers' phones
- collaborations have included:
  - CABI's mNutrition and Direct2Farm projects
  - the MSSRF farmer alerting system

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CABI



## Mass extension via TV and radio services

- Plantwise content is also used as a source of information for TV and radio programmes to spread info when outbreaks are observed
- advice on treating pests is widely broadcast to maximise the reach of Plantwise advice to farmers who cannot attend plant clinics
- collaborations have included:
  - Utugi TV in Kenya
  - ZNBC-Radio 2 in Zambia
  - Nkhotakota community radio in Malawi

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## Plantwise blog and social media

- communicating short articles on Plantwise and general plant health news from around the world
- accessible online and via email to subscribers

[blog.plantwise.org](http://blog.plantwise.org)  
[www.twitter.com/CABI\\_Plantwise](https://www.twitter.com/CABI_Plantwise)  
[www.facebook.com/Plantwise](https://www.facebook.com/Plantwise)  
[www.youtube.com/Plantwise](https://www.youtube.com/Plantwise)








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## TOPIC 2: Beyond climate

Weather and market are two connected sources of risks in the agricultural sector. Solutions to each area usually disconnect the other. Each of the three presenters under this topic will showcase how his/her tool/application combines/merges information from climate and market sources for extensive agricultural sector risk management, beyond the climate-induced risks like drought, flooding etc.

Presentation 2.1: GEOGLAM Crop Monitor for Early Warning  
Michael Deshayes, GEOGLAM

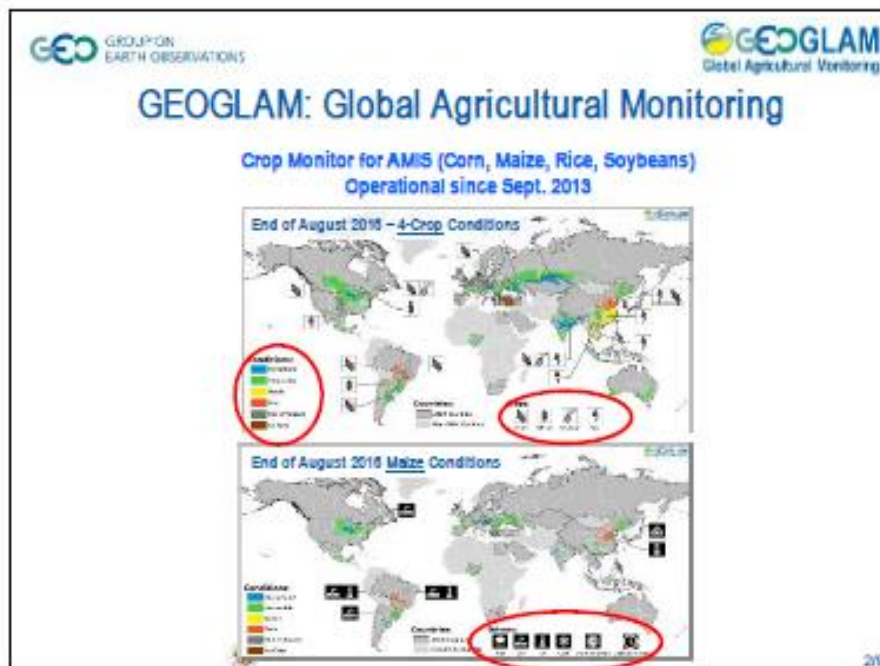
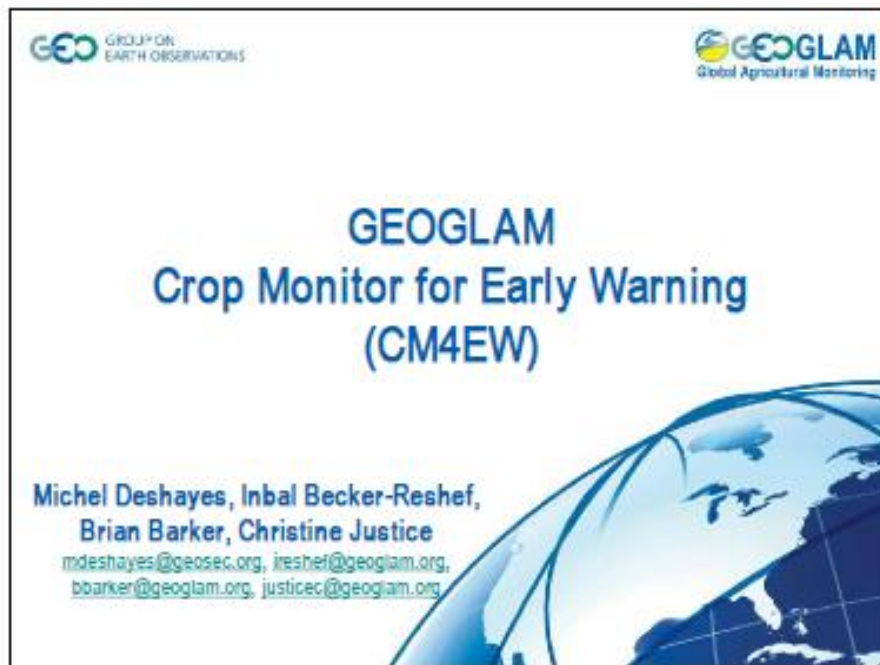
Presentation 2.2: PREMISE DATA  
Paolo Lucchino, PREMISE


Presentation 2.3: ECOWAS-ECOAGRIS  
Moussa Mama, Regional Officer, AGRHYMET, ECOWAS


## Presentation 2.1:

### GEOGLAM Crop Monitor for Early Warning

Michael Deshayes, GEOGLAM







## Crop Monitor for Early Warning (CM4EW)

- **Crop Monitor for Early Warning (CM4EW)**
  - Grew out of the success of the AMIS Crop Monitor
  - Recognition even more pressing of a need for enhanced, reliable, vetted information on crop conditions within countries at risk
  - Based on Early Warning Community's activities
  - 2-year development :
    - *Agreement on organising collaborative monitoring of Countries at Risk (May 2014)*
    - *Meetings: IMAAFS Conference, Addis-Ababa (Oct. 2014), FAO Rome (May 2015)*
    - *Development of a prototype Website, allowing partners inputs and data & information sharing*
    - *First bulletin: 5st February 2016*

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## Objective and Partners

- **Exchange information, build consensus and reduce uncertainty in countries most vulnerable to food insecurity, to strengthen agricultural decision making**
- **Monthly publication, first bulletin published Feb. 2016**
- **Partners :**









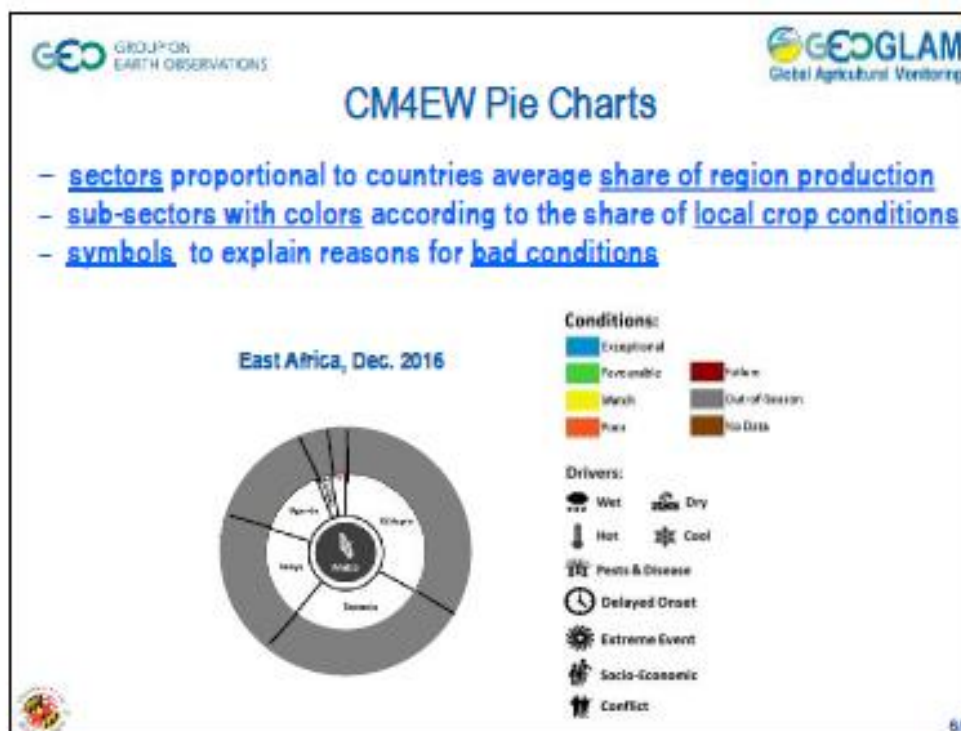
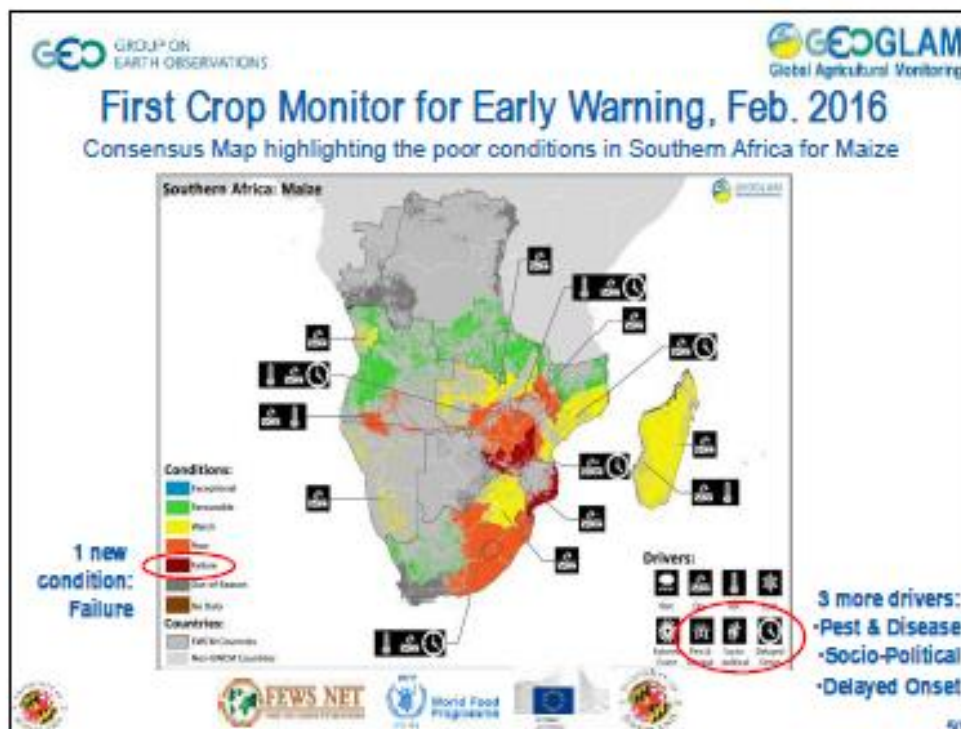






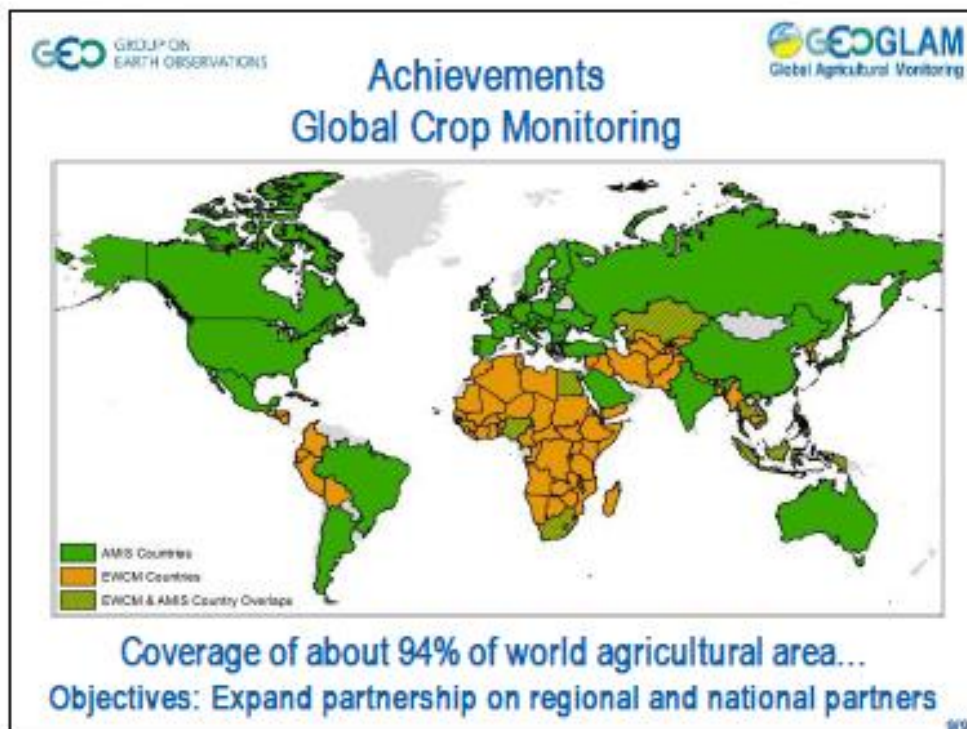












**For more information or questions please contact:**  
Inbal Becker-Reshef: [ireshef@geoglam.org](mailto:ireshef@geoglam.org)  
GEOGLAM Secretariat, Crop Monitor Lead

<http://www.geoglam.org>  
<http://www.geoglam-crop-monitor.org>

10/9

## Presentation 2.2:

### PREMISE DATA

Paolo Lucchino, PREMISE



### Premise Overview

**Premise creates mobile networks that capture ground truth in real time to improve outcomes**

#### Selected Platform Applications

##### Food Price Monitoring

Monitoring price volatility and food scarcity to inform aid interventions.

##### Vector-borne Disease Control

Targeting vector control efforts through risk mapping and citizen engagement

##### Emergency Response

Mobile crowdsourced data delivers real-time, accurate emergency assessments and prioritization.

#### PLATFORM CAPABILITIES



Identity



Capability



Incentive



Direction



Validation

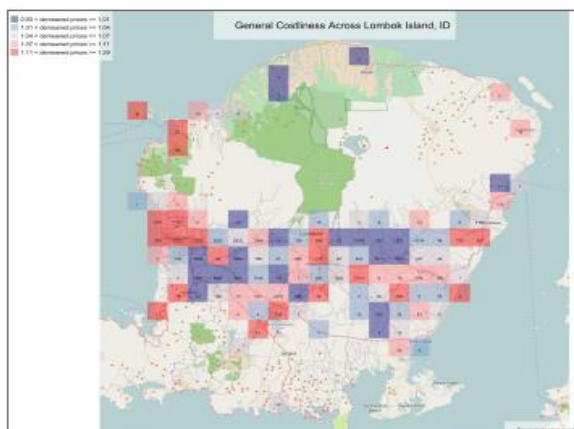


Optimization

Premise Data Corporation - Company Confidential 2

### Example Programs

#### Food Price Monitoring



- Provide **real-time measurement across a broad set of commodities** at targeted markets across a geography.
- In case of **product unavailability**, drill down to understand causes at local level.
- Measure price trends over time, generate **price spike alerts**, and support faster intervention.



Premise Data Corporation - Company Confidential 3

## Challenges and solutions

### Tackling the challenges of rural and remote areas

Rural contexts require the **tech solution to be tailored to local needs** and be complemented by **significant operational capacity**. We continuously refine our product and operations to ensure these hurdles can be overcome.

#### Limited **connectivity**

- App offers fully operational '**offline mode**'.
- Tasks can be reserved for offline completion, and submission deferred to when connectivity is available.

#### **Challenging recruitment** and limited extant user skillset

- Dedicated **Operations team** with in-country network managers.
- **Toolbox of intervention modalities** tailored to local context, ranging from social media ads to formal partnerships with local NGOs.
- User training and **incremental tiering** as they 'learn the ropes'.

#### **Indirect influence** on user behaviour

- Users typically engage on a voluntary basis.
- We use data-science driven task and incentive allocation mechanisms to *orchestrate* crowdsourcing.
- Users provided with flexible task reservation tools to signal interest and manage their workflows.

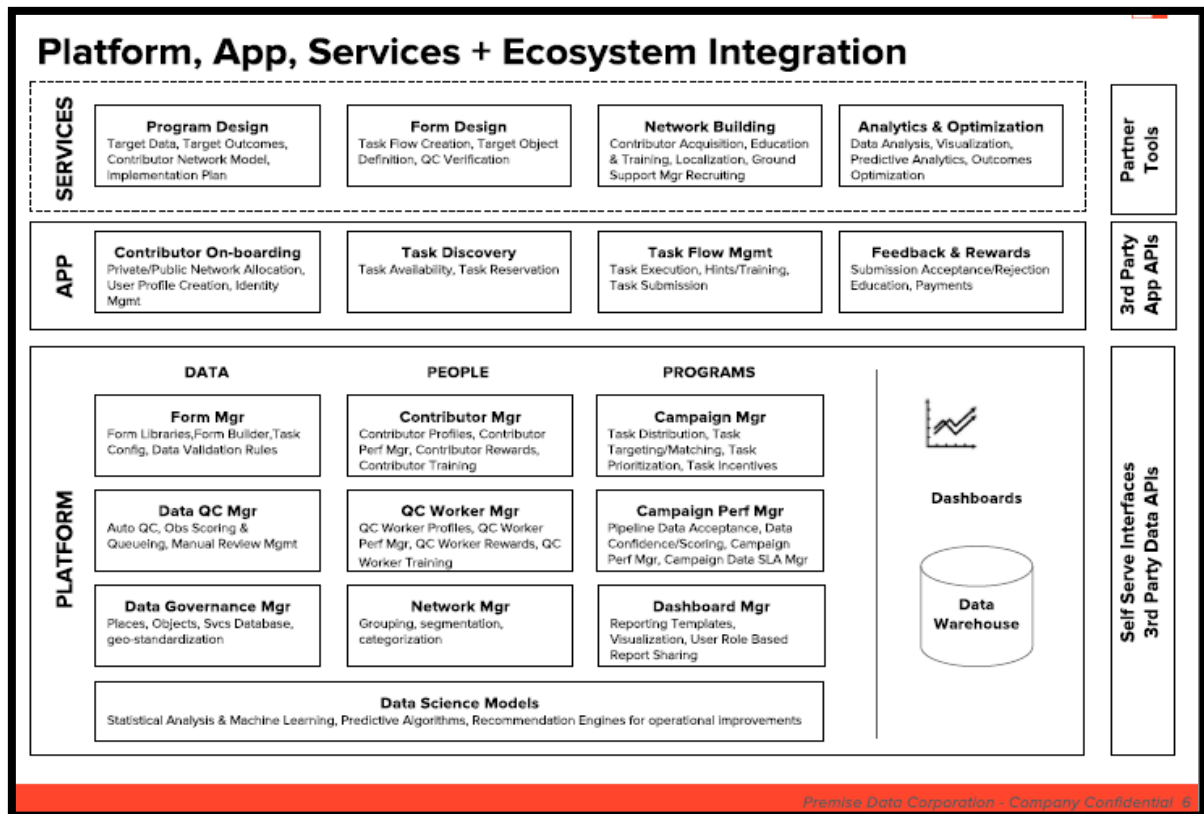
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# Thank you!

Paolo Lucchino  
[paolo@premise.com](mailto:paolo@premise.com)

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## Example Programs

### Vector Control Optimization

Aggregate field data and visualize **threat risk status** across broad physical space

- Discovery of known **vector threats** and data gaps.
- Monitoring of **targeted routes** and locations.
- Neighborhood-level **risk score** that combines multiple risk factors.
- Availability of exact location and media input

**Cartagena, CO**

Neighborhood	Risk
La Paz	High
Paraiso I	Medium
Paraiso II	Low
La Maria	Low
Monasterio	Medium
Boston	High
Puerto de Pescadores	High
La Esperanza	Low
Puerto Alicia	Low

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## Presentation 2.3:

### ECOWAS-ECOAGRIS

Moussa Mama, Regional Officer, AGRHYMET, ECOWAS

**CILSS:** Au cœur de la résilience au Sahel et en Afrique de l'Ouest

**Knowledge sharing meeting: An innovative initiative model on the IS (ECOAGRIS)**  
**31 to 1 February 2017**  
**Dr. Moussa Mama**

**Project team**

**ECOAGRIS**

**CILSS:** Au cœur de la résilience au Sahel et en Afrique de l'Ouest

**Objectives of the component**

- Strengthen the national and regional information systems on food and nutrition security
- Improve decision support information of quality for a better response to food and nutrition crises in the CILSS/ECOWAS/UEMOA region

CILSS: Au cœur de la résilience au Sahel et en Afrique de l'Ouest

Expected results


R1.1	Le dispositif ECOAGRIS est mis en place
R1.2	Les systèmes d'information sur la SAN sont renforcés
R2.1	Les dispositifs de suivi des stocks sont mis en place
R2.2	Le Cadre Harmonisé d'analyse est renforcé

CILSS: Au cœur de la résilience au Sahel et en Afrique de l'Ouest

ECOAGRIS :An innovative initiative

4 guidance principles oriented us in designing the mechanism:

- Harmonizing tools and procedures;
- Building a common baseline;
- Respecting sovereignty of countries as for their data;
- Setting up a regulation framework and management bodies for the mechanism;




**CILSS :** Au cœur de la résilience au Sahel et en Afrique de l'Ouest

## ECOAGRIS :An innovative initiative

We consider that ECOAGRIS is an innovative initiative.

We will present you the innovative character of ECOAGRIS under 3 aspects:

- **Management;**
- **Technique;**
- **Regulation.**




**CILSS :** Au cœur de la résilience au Sahel et en Afrique de l'Ouest

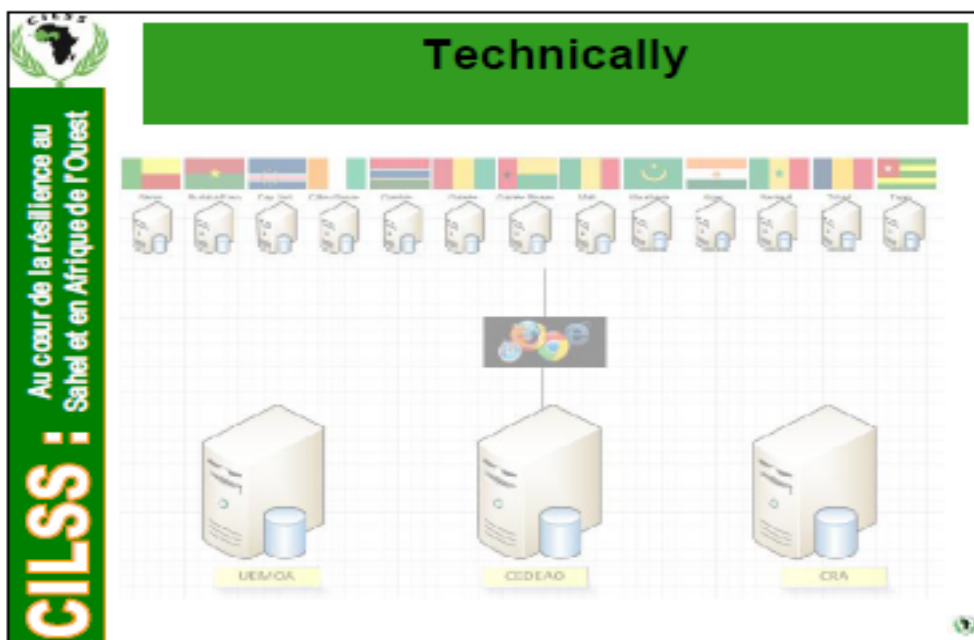
## Management

- Many national information mechanism but no mechanisms that federate the entire sub-sectors of the agricultural sector at national level and CILSS/ECOWAS region;
- Agreement on a set of consensual indicators collected by sectorial services of the 17 countries and using the supports: collection sheet **projection and planning**
- Have, easily the production forecasts, data of the cropping season at country level **reorient the needs**;
- At regional level, we have the data story on the value chain of the agricultural sector and the progress of the production trends, stocks and prices;
- The region has a common and unique baseline and that facilitate the elaboration of agricultural policies based on reliable and coherent data;
- From the system to the Cadre Harmonisé tool
- The confidence of donors is strengthened for they are able to monitor with us the activities trends.

CILSS : Au cœur de la résilience au Sahel et en Afrique de l'Ouest



- A partnership with international NGOs (Save the children, Oxfam GB, Oxfam Intermoon, FEG) for studies on HEA (livelihood zoning, Baseline, outcome analysis),
- Mapping the of the baseline situation of trader stocks (Market Information System) with RESIMAO,
- Monitoring method of proximity stocks → **valorization of international and regional (Sustainability efficiency)**




CILSS : Au cœur de la résilience au Sahel et en Afrique de l'Ouest



- 209 configured Indicators with Implemented calculation functions;
- 54 collection sheets developed and Integrated;
- 18 systems built and operational composed of:
  - 12 personalized sectoral systems for each of the countries « EWS, Agricultural production, Livestock, Fishing and aquaculture, Agricultural market, Agricultural inputs, Research results, Natural resources and climate change, Nutrition, Stocks, Agro-Hydro-Meteo, Macro-economy»;
  - 03 automatic data transfer and consolidation process;
  - 01 focal point system for each country ;
  - 01 regional system;
  - 01 federator portal ;
- 17 countries covered + 03 Institutions (ARC , UEMOA , ECOWAS);
- 02 work languages (French, English);
- A unique management of security, a web based and redundant architecture, available to the user in case his/her server stop working;
- All the beneficiary countries are equipped with necessary equipment.

CILSS : Au cœur de la résilience au Sahel et en Afrique de l'Ouest



Regulation

A regulation framework regulating the governance people and national and regional bodies to assure the sustainability and efficiency of the system

:

National:

COS ( Decisional body);

CTE: (Operation body);

UNGD (Data management Unit);

Regional:

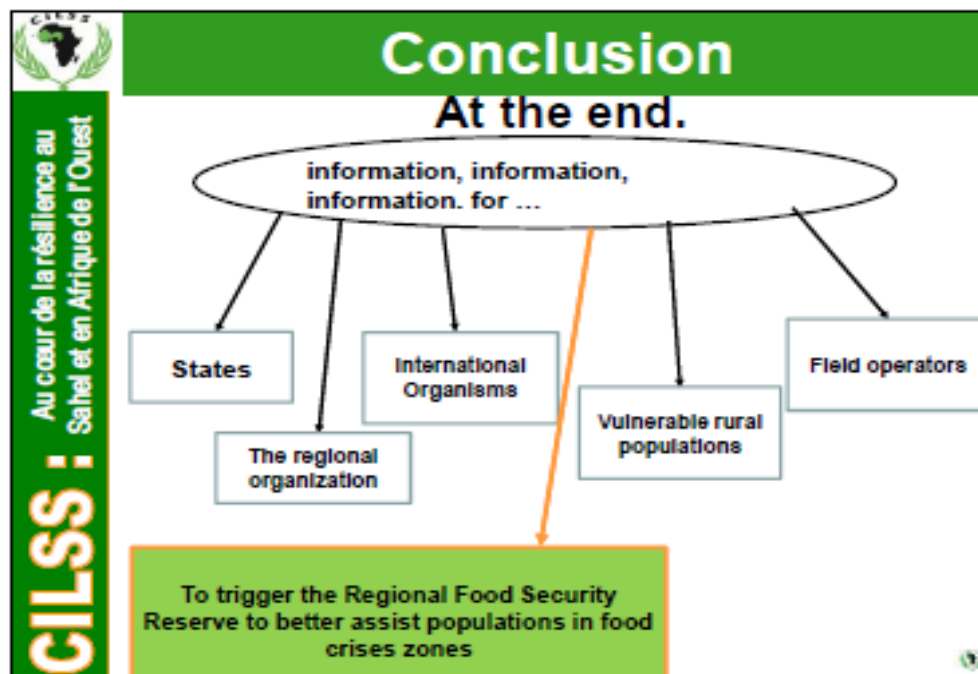
CPR, CTR ——— Sustainability, efficiency of the system



CILSS : Au cœur de la résilience au Sahel et en Afrique de l'Ouest

## Challenges

- Strengthening the institutional anchorage (regular consultation meeting of and data collection, regular training of sectorial focal points, ...) ;
- Need of additional financial need for « strengthening » the mechanism and progressive coverage of the functioning budget by countries ( Internet charges, work meeting, etc.) ;
- The ECOAGRIS mechanism is effectively perceived by member states as a decision support and anticipation tool for food and nutrition crises.





## TOPIC 3: From Insurance to Social protection

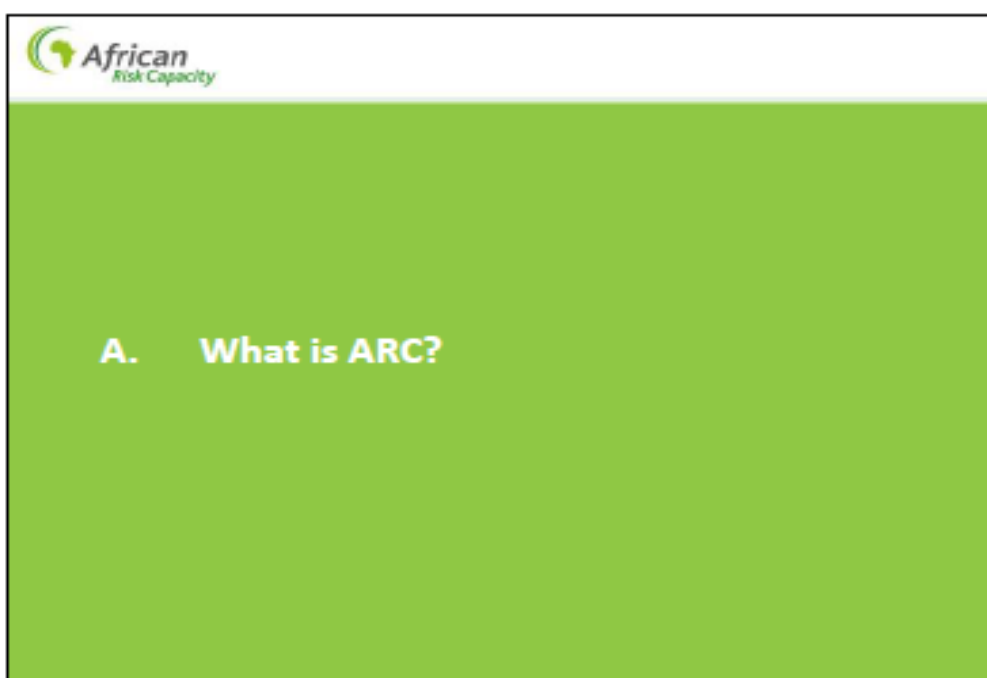
Early warning systems form main inputs for proper assessments, forecasting and monitoring of risks. They play important roles for food security, health/disease monitoring, and crop/plant production management. International institutions rely on early warning systems to formulate insurance and social protection tools for assisting vulnerable agricultural households to manage risks. Presenters in this group will showcase how their tools/initiatives work to communicate information for better agricultural risk solutions either at the policy, market or farmer-level.

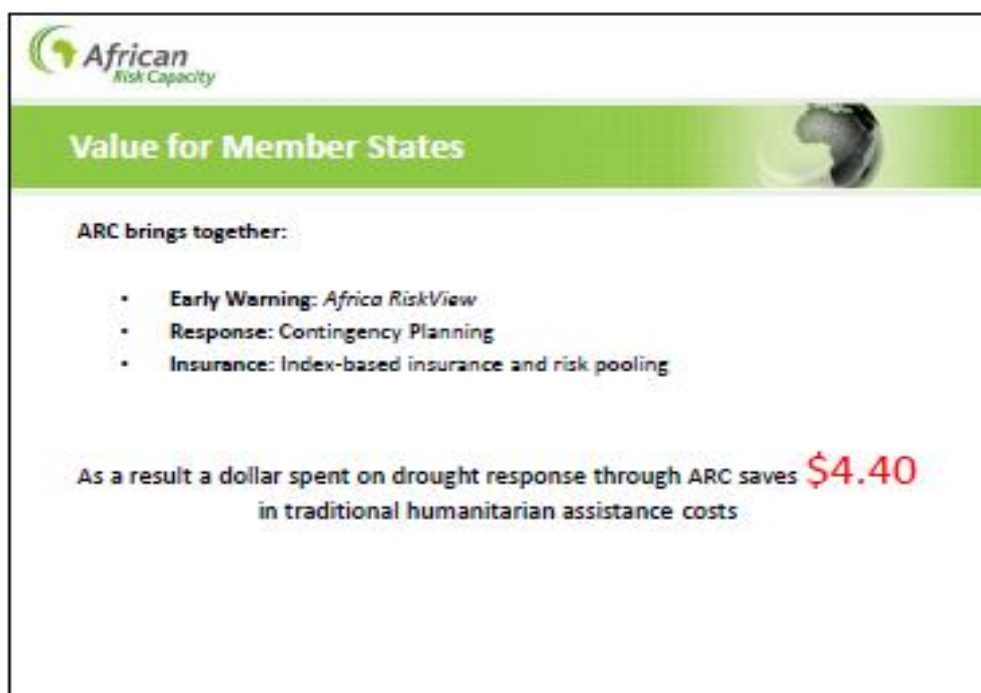
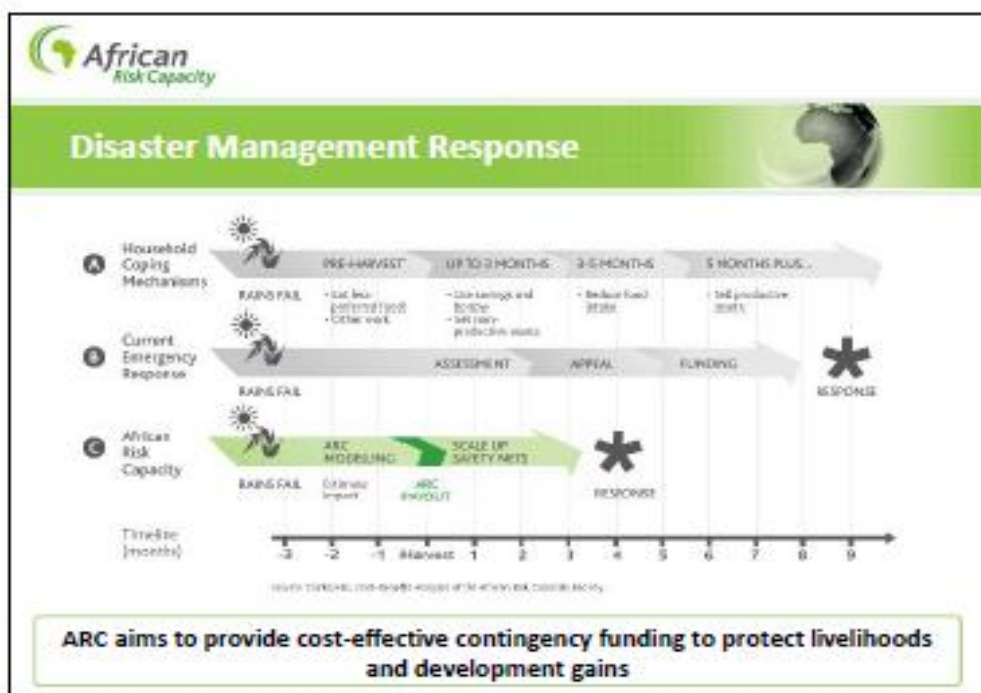
- Presentation 3.1: African Risk Capacity (ARC), RiskView  
Federica Carfagna, ARC Representative at the WFP
- Presentation 3.2: The use of satellite imagery for Agricultural monitoring and insurances  
Laurent Tits, VITO Representative
- Presentation 3.3: The role of social protection in managing agricultural risk  
Natalia WinderRossi, Senior Social Protection Officer, FAO

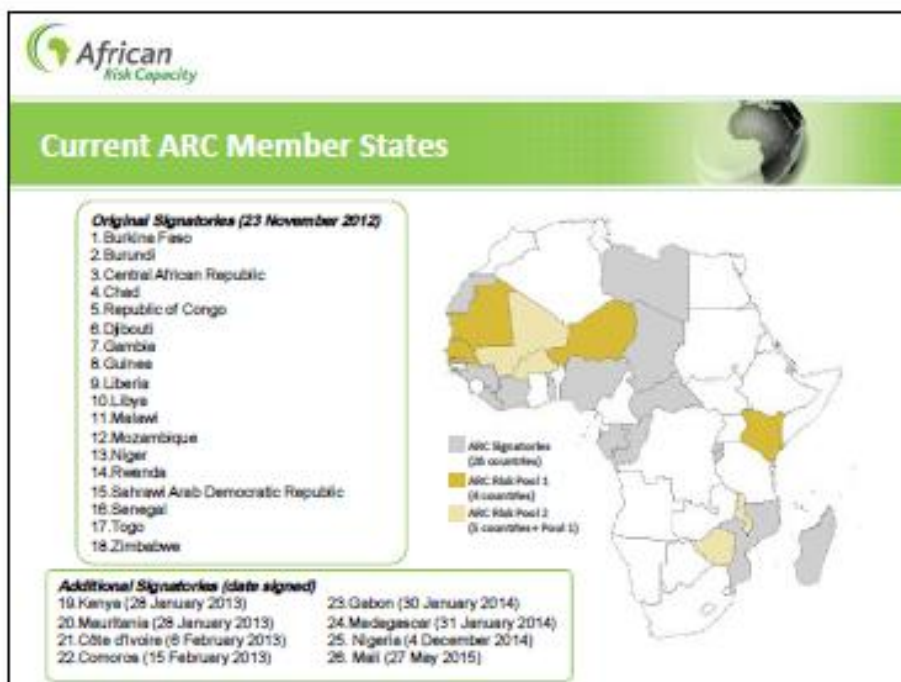
### Presentation 3.1:

**African Risk Capacity (ARC), RiskView**

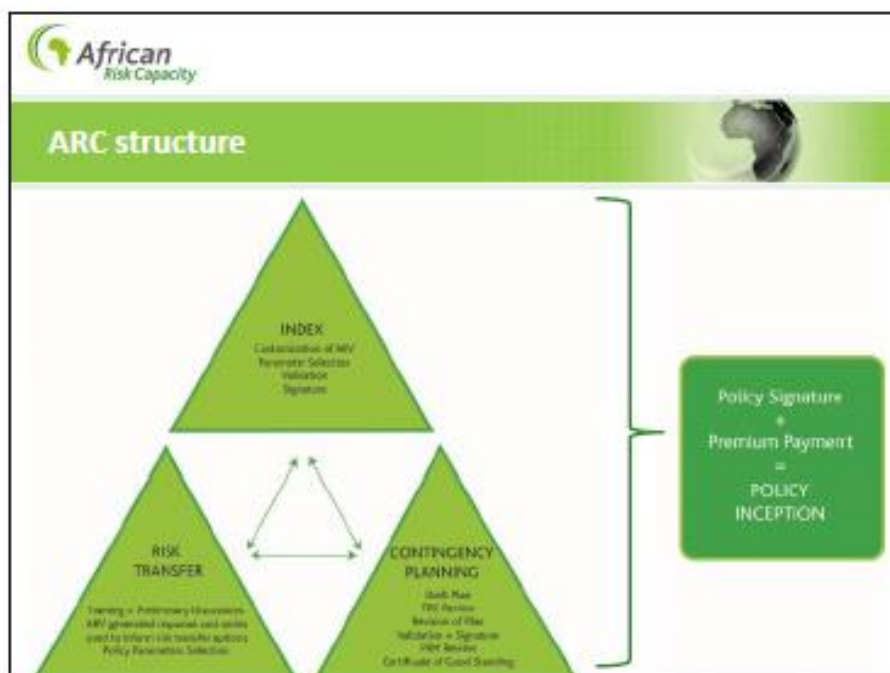
Federica Carfagna, ARC Representative at the WFP











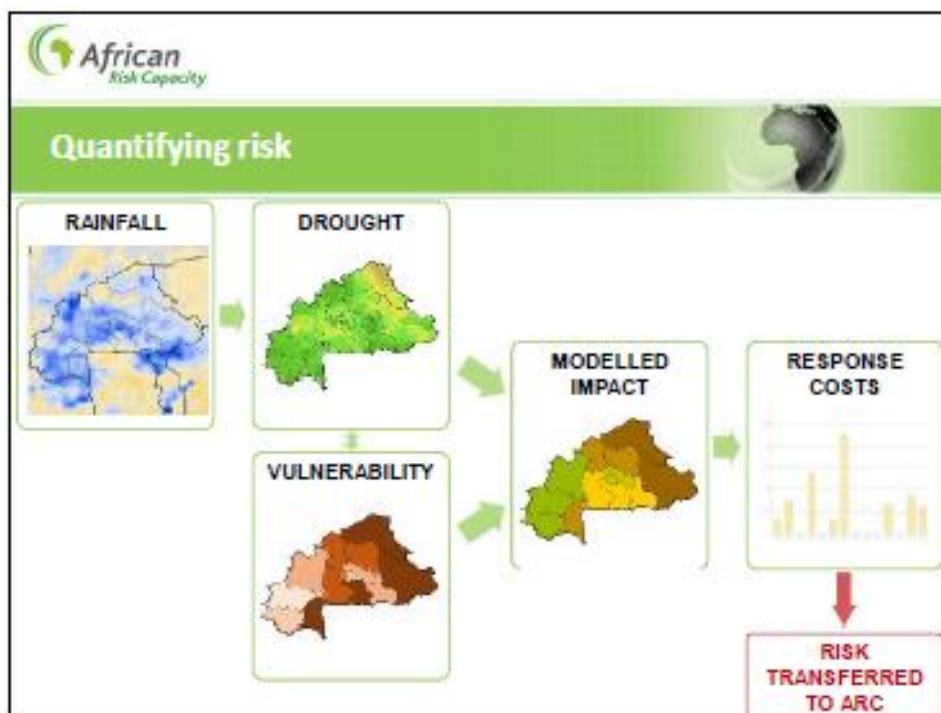


## **D. Drought Risk Model: *Africa RiskView***

 **Africa RiskView**

Africa RiskView is a drought risk modelling platform that allows countries to:

- Analyse rainfall in near-real time
- Monitor the agricultural and rangeland season
- Estimates Impact on people
- Calculate Response Cost
- Define Risk Transfer





**African Risk Capacity**

## Pool 1: Payout Implementation

	<b>Senegal (\$16.5 Million)</b>	<b>Mauritania (\$6.3 Million)</b>	<b>Niger (\$3.5 Million)</b>
<b>Planned Use and Targeted Beneficiaries</b>	<ul style="list-style-type: none"> <li>Targeted food distribution</li> <li>Total beneficiaries: 927,416 people</li> <li>Subsidized sales of cattle feed</li> <li>Beneficiaries: 570,459 animals</li> </ul>	<ul style="list-style-type: none"> <li>Targeted Food distribution</li> <li>Total beneficiaries: 250,000 people.</li> <li>In March 50,00 households identified and provided with distribution cards (average 5 people per household)</li> </ul>	<ul style="list-style-type: none"> <li>Targeted Food Distribution</li> <li>Total beneficiaries: 157,000 people.</li> <li>Conditional cash transfer and food distribution in drought-affected regions</li> </ul>
	<ul style="list-style-type: none"> <li>End of season: Dec 30</li> <li>Funds released from Ltd: Jan 27</li> <li>Premium: \$3.4 m</li> </ul>	<ul style="list-style-type: none"> <li>End of season: Nov 20</li> <li>Funds released from Ltd: Jan 29</li> <li>Premium: \$1.4 m</li> </ul>	<ul style="list-style-type: none"> <li>End of season: Oct 31</li> <li>Funds released from Ltd: Feb 25</li> <li>Premium: \$3.0 m</li> </ul>
<b>Monitoring &amp; Evaluation on payout implementation ongoing</b>			

**African Risk Capacity**

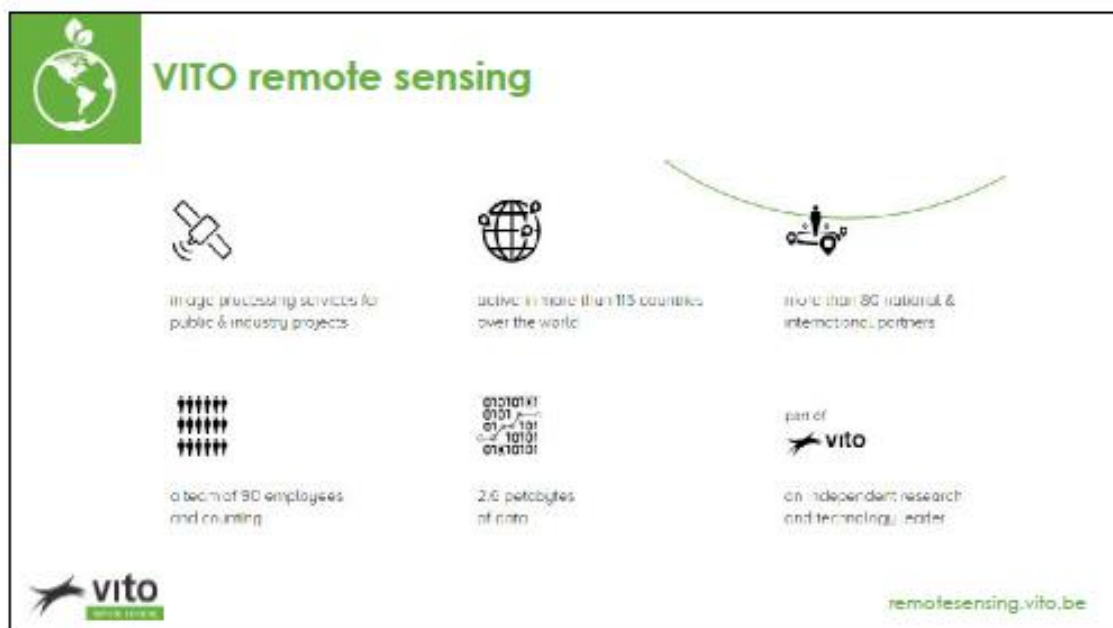
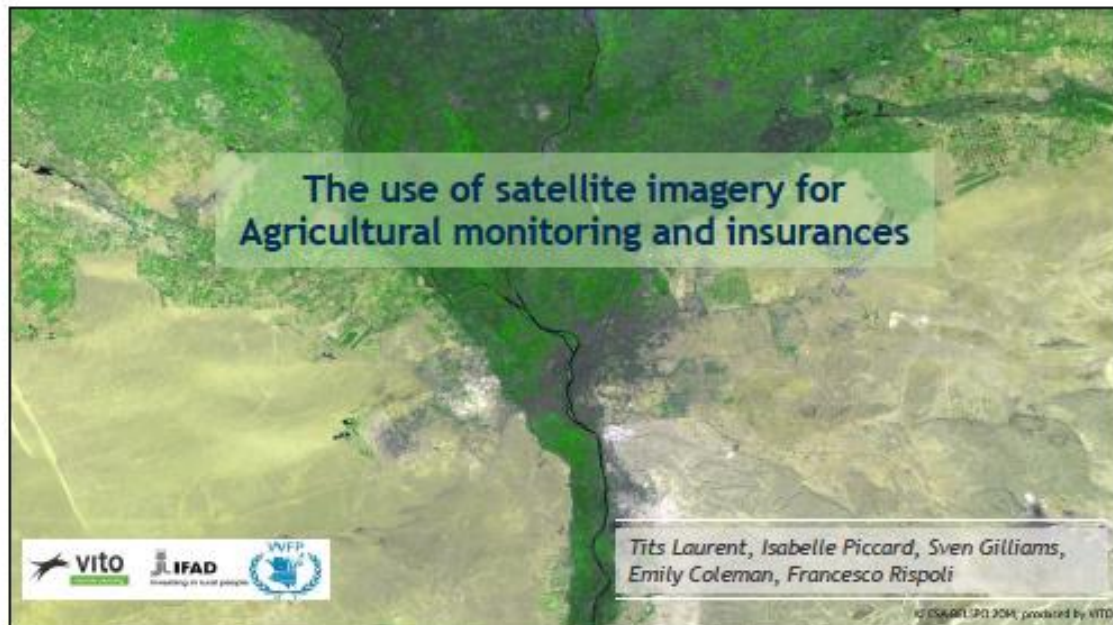
# THANK YOU !

Website: [www.africanriskcapacity.org](http://www.africanriskcapacity.org)  
Twitter: @ARCapacity

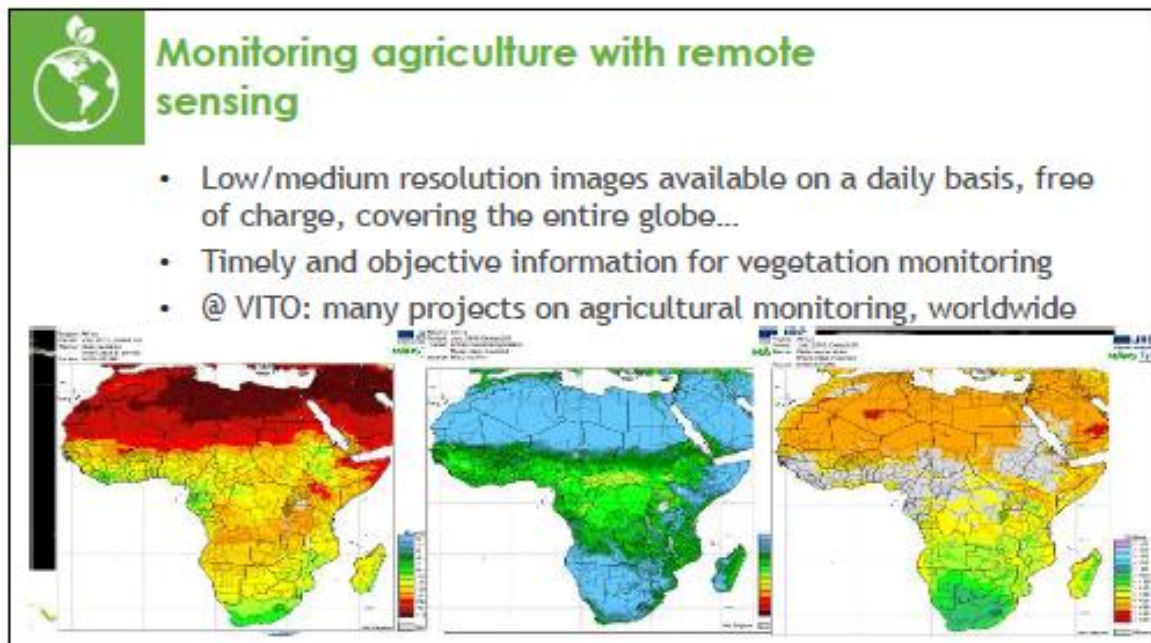
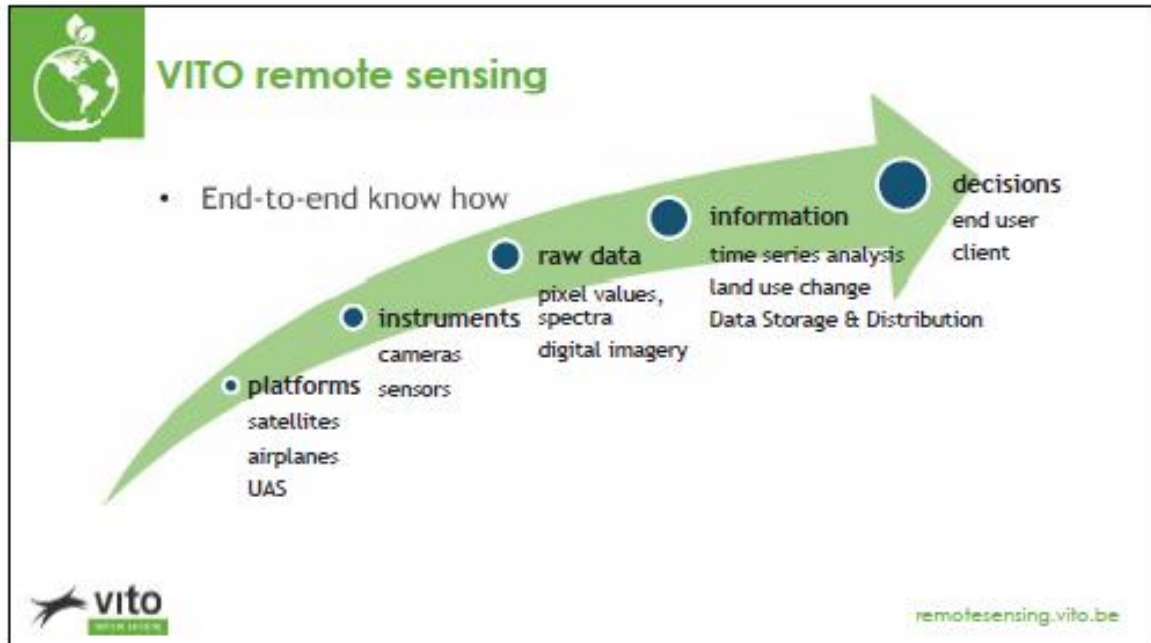
## Presentation 3.2:

### The use of satellite imagery for Agricultural monitoring and insurances

Laurent Tits, VITO Representative












## Agricultural insurances




- **Crop monitoring, damage and risk assessment**  
= info to support “traditional insurances”
  - Problem detection in an early stage -> where pay-out expected?
  - Guidance of field visits by loss adjusters
  - Control of damage claims -> claim in problem area or not?
  - Information on historical crop losses -> risk estimation -> improved premium calculation
- **Index insurance**
  - Satellite based index



remotesensing.vito.be



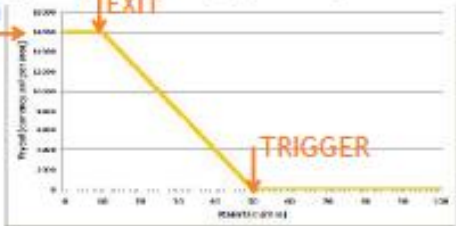
## Index insurance




- “Index insurances”
  - Pay-out based on a “regional” index
  - Define insurance model with ‘trigger’ (minimum payment) and ‘exit’ (maximum payment)



Maximum payout




remotesensing.vito.be



## Index insurance: WRMF project

“Improving Weather Risk Management in West Africa: Evaluation of Remote Sensing For Index Insurance”

- 4 Test Areas (20x20km) in Senegal
- 3 crops (Groundnut, Millet, Maize)
- Ground data collection by local research institutions ISRA & CERAAS

» Evaluation Committee:

- » International experts: ESA, NASA, WFP, FAO, JRC
- » Local experts: CSE, CERAAS, ISRA
- » Insurance sector: Planet Guarantee, SwissRe, MunichRe, GIIF, I4

remotesensing.vito.be

## Index insurance: Remote sensing indices tested

- Technical co-ordinator: VITO
- Overview of the Remote Sensing Service Providers (RSSPs) and their approaches:

RSSP	Type of product/approach	Remote sensing data used
VITO	Vegetation indices (fAPAR) + Rainfall estimates	SPOT-VGT / Proba-V fAPAR TAMSAT rainfall estimates
FewsNet (USGS)	Actual evapotranspiration	MODIS based actual ET
EARS	Relative evapotranspiration	MSG based relative ET
ITC	Vegetation indices (NDVI)	SPOT-VGT / Proba-V NDVI
IRI	Rainfall Estimates	NOAA based RFE2 ARC
Geoville	Radar-based estimation of soil moisture SoS based on Soil Water Index	ERS / METOP ASCAT
Sermap	Radar crop maps and SoS indicators	CosmoSkyMed data

remotesensing.vito.be

# Index insurance: VITO insurance product

Insurance product based on RS derived yield estimates


- Input:
  - Remote Sensing (RS) data:
    - 10-daily SPOT-VGT (1km) fAPAR
    - 10-daily TAMSAT (4km) rainfall estimates (RFE)
    - Time series 1998-present
  - Cropland mask
  - Yield statistics (2001-2014) for groups of villages
- Insurance product development
- Output:
  - Insurance contract structure (model + trigger, exit) & Historical performance assessment
  - Index values (yield estimates) per season, per crop, per "region" (UAI, Unit Area of Insurance)

13 **vito** VERBA ET FACTA

**ILIFAD** International Livestock Research Institute

**WFP** World Food Programme

**afcf** AFRICAN FOOD COUNCIL



## Index insurance

- » Overall:
  - » Knowledge of land use, local farming practices and a variety of other factors is necessary.
  - » Remote sensing data is increasingly available, but supplementary data availability and its cost is more of a constraint
- » Technical:
  - » The gaps between actual yields and potential yields is significant and highly variable: the accurate definition of the Unit Areas of Insurance (UAI's) is key!
- » Performance:
  - » The lack of appropriate yield data and ground information is one of the primary challenges for designing and testing index insurance
  - » Product design has a critical influence on performance.
  - » Rather short time series of remote sensing data (15 years max)
  - » Historical losses better tracked with vegetation-based indices; use of crop maps and the combination of remote sensing approaches may have contributed to the relatively better performance.





## Presentation 3.3:

### The role of social protection in managing agricultural risk

Natalia WinderRossi, Senior Social Protection Officer, FAO



#### The role of social protection in managing agricultural risk

*Natalia Winder Rossi, Global Social Protection Team Leader, FAO*

*Information Systems for Agricultural Risk Management Workshop - FARM/IFAD  
January 2017*

From Protection to Production

#### Overview

- What do we mean by social protection?
- Social protection as a strategy for rural poverty reduction and agriculture risk management
- From concept to programming: risk informed social protection systems

From Protection to Production

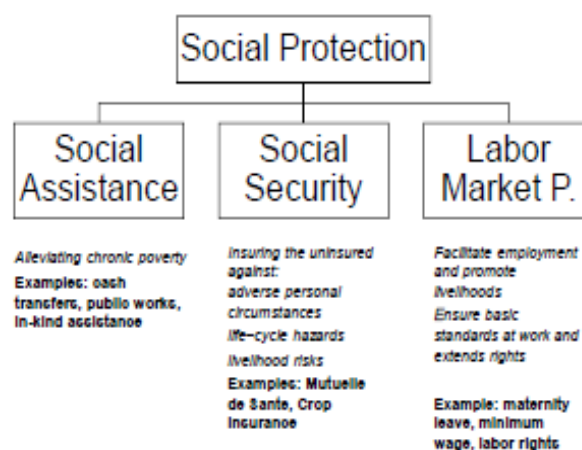
## What is Social Protection?



- At a minimum, risk management strategy
  - Manage risk; reduce negative coping mechanisms
- A poverty reduction strategy
  - Strategy to eliminate hunger, and contribute to all four dimensions of food security
  - Helping to accelerate progress toward reducing rural poverty
  - Reduce economic barriers to access essential services (social, financial and other)
  - Addressing the social and economic determinants of malnutrition
- A strategy for resilience and inclusive growth
  - Strengthening the capacity of households to cope, manage and withstand shocks and (natural and man-made) disasters
  - In addition to social impacts, social protection enhances the economic and productive capacity of even the poorest of the poor
  - Empowerment tool (for those excluded, including poor, women, youth, etc.)

From Protection to Production

## Social Protection Pillars



From Protection to Production

## Multiple risks and vulnerabilities

- Different vulnerabilities across the agriculture sector: farmers, fishermen, forest dependent communities
- Small-scale / family farmers experience specific risks and vulnerabilities including:
  - Chronic poverty and food insecurity
  - In many contexts, social assistance beneficiaries (or eligible) are subsistence, small-scale, family farmers
  - Interdependence between consumption and productive decisions.
    - dedicate time to domestic chores & or to working on the farm?
    - Send children to school or to work?
    - Invest in schooling and health or in production?
    - Produce cash crops, diverse foods or staple food?
- Even from those that have been able to move out of the poverty (or in the process of) continue to experience risks and vulnerability – climate, weather shocks, price volatility, health, and other



From Protection to Production

## Social protection contributes to strategies for managing agricultural risks

- **Risk mitigation/adaptation** (ex-ante preventive measures) activities designed to reduce the likelihood of an adverse event or reduce the severity of actual losses, allowing families to reduce their exposure to hazards:
  - cash transfers have shown their ability to enhance the capacity of households to invest in productive and economic activities and thus to diversify their asset base;
  - Cash and food for work, Community investment in disaster and climate responsive infrastructure and assets (e.g: Somalia and rehabilitation of ag infrastructure)
  - Risk transfer, such as insurance and hedging; and
- **Risk coping** providing immediate relief after shocks and disasters.
  - E.g. by expanding vertically/horizontally existing social safety nets
- **Risk reduction through resilience** to withstand and cope with events ex ante.
  - Examples of these government strategies include social safety net programmes focused on building human capital, productive assets or productive inclusion, graduation programs, Active Labor Market programs, Enhancing the financial capacity to investment in climate-smart technologies and practices ("climate justice").

\*Evidence from seven countries in Sub-Saharan Africa.

\*Specific analysis in Zambia looking at weather related shocks

From Protection to Production

## FAO: From Protection to Production

FAO filling a critical evidence gap and contributing to enhance the economic case for scale-up of social protection

### Examples of impacts

#### At household level:

- Households invest cash transfers in livelihood activities
  - Increased purchase and use of agricultural inputs and tools, leading to increased production, and in some cases, market participation
  - Increased ownership of livestock, ranging from large to small animals
  - Increased participation in non farm family enterprises
- Household members shift from casual wage labour to on farm and family productive activities
- Improved ability to manage risk
  - Reduction in negative risk coping strategies
  - Strengthened informal safety nets of reciprocity
  - Reduction in debt; increase in savings

#### At community and local economy levels

- Positive local income multipliers



From Protection to Production

## From concept to programming: Shock-responsive Social Protection



Elements to be considered for an SP system to be Risk informed and Shock Responsive

- Design and implementation informed by multi-dimensional risk and vulnerability analysis
- flexible to allow the scale-up of support in case of threats and crisis (without the need to set-up and additional ad-hoc system for the response to a punctual disaster).
- Contributing to resilience building; acting to minimize negative coping strategies, mitigate negative impacts, while promoting sustainable practices
- Addressing needs of host communities, as well as displaced populations in times of crises

Social Protection: From Protection to Production





**Many thanks**

For more information on FAO's work:  
<http://www.fao.org/socle-protection/en/>



From Protection to Production



## TOPIC 4: Global holistic IS-ARM

Global holistic IS-ARM group consists of presenters from different areas of risk themes: market, diseases and weather. Showcases in this group would present to the audience the possibilities to collect, maintain and disseminate comprehensive package of risk information.

Presentation 4.1: DataViz: Visualizing Food Security Data, WFP  
Rogerio Bonifacio, Geospatial Analysis Team Leader, WFP

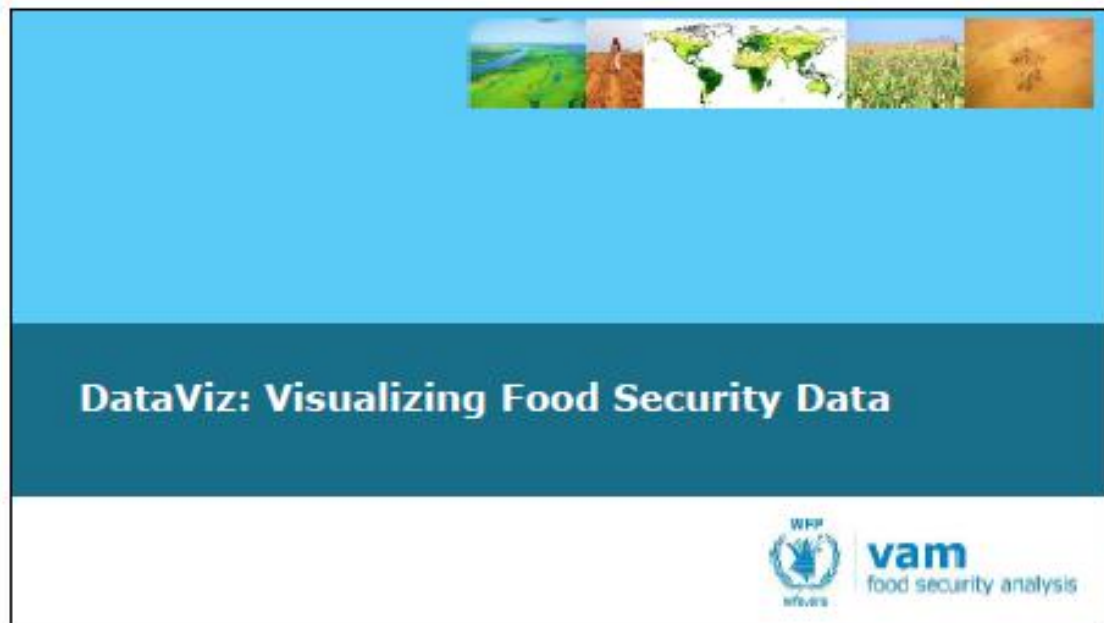
Presentation 4.2: Integrated Food Security Risk Analysis, FEWS NET  
Bruce Isaacson FEWS NET Chief of Party, USAID

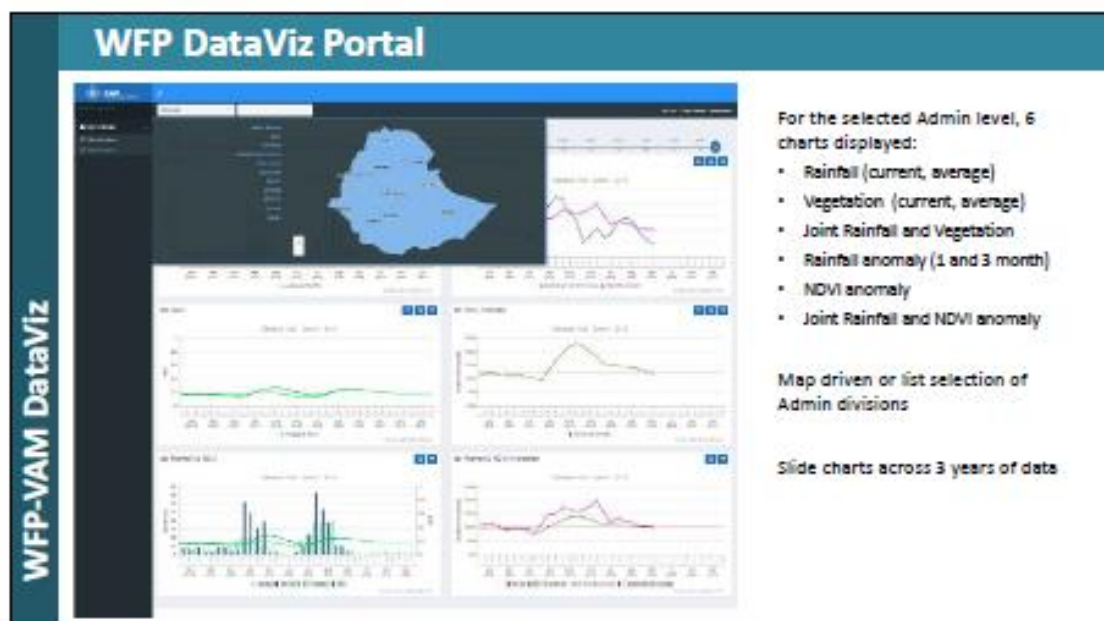
Presentation 4.3: Event Mobile Application (EMA-i): A field reporting digital tool to enhance national disease surveillance systems, FAO/EMPRES  
Fairouz Larfaoui, Technical Expert (Veterinarian), FAO

## Presentation 4.1:

### DataViz: Visualizing Food Security Data, WFP

Rogério Bonifacio, Geospatial Analysis Team Leader, WFP





WFP-VAM DataViz

DataViz: Economic Explorer


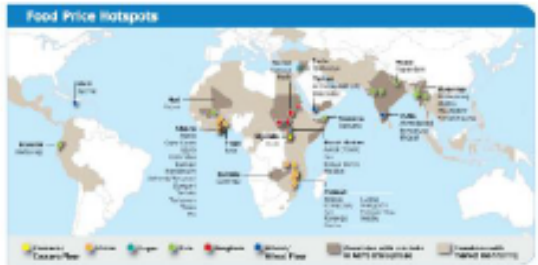
- WFP and partners monitor retail and wholesale **prices** of staple **food** items, **livestock price**, **wage rates**, and **energy prices** in the countries WFP operates in.
- After decentralised data upload and quality checks, the WFP price database hosts price **data for more than 1,530 markets in 78 countries**.
- We visualise prices in the recently launched **Economic Explorer** by country and market and commodity.
- Also display macro economic indicators such as headline-inflation, food inflation, exchange rates, GDP and current account.

WFP-VAM DataViz

DataViz: Economic Explorer

**WHY?**

- Quick overview of price and economic developments
- Early warning function: ALPS indicator for price hotspots in Next viz-update
- Used for internal operational programming (resource allocation, transfer value setting, food procurement)
- Sharing data for more in-depth analysis
- Data used for WFP market monitor, price bulletins.



WFP-VAM DataViz

## DataViz: Economic Explorer Quick Try

- [http://dataviz.vam.wfp.org/economic\\_explorer/prices](http://dataviz.vam.wfp.org/economic_explorer/prices)
- Select country: **Tanzania**; **Maize wholesale** – national average price will appear
- Select markets: **Arusha, Iringa, Kigoma** – click apply – three price series will appear; can be hidden by clicking on legend.
- Move time slider back and forth
- Click left commodity icon, add **Rice wholesale**
- In the menu section, expand macro economics, click inflation
- Finally click on currencies global – this will bring up a map in tableau for hotspots of local currency depreciation against the US

## THANK YOU

For more information, please contact:

Rogério Bonifácio

[rogerio.bonifacio@wfp.org](mailto:rogerio.bonifacio@wfp.org)

+39 06 6513 3917



**vam**  
food security analysis

## Presentation 4.2:

### Integrated Food Security Risk Analysis, FEWS NET

Bruce Isaacson, FEWS NET Chief of Party, USAID






**Integrated Food Security Risk Analysis**  
Bruce Isaacson, FEWS NET



MARKETS & TRADE • AGROCLIMATOLOGY • LIVELIHOODS • NUTRITION •



**Workshop on Information Systems  
for Agriculture Risk Management**  
31 January 2017  
IFAD, Rome






**Outline**

- Introduction to FEWS NET
- Analytical Approach

FAMINE EARLY WARNING SYSTEMS NETWORK

1






## Introduction to FEWS NET

FAMINE EARLY WARNING SYSTEMS NETWORK


2







## The purpose of FEWS NET

- To prevent famine and mitigate risks of food insecurity by providing decision makers with information that is accurate, credible, timely, and actionable.
- To strengthen the ability of FEWS NET countries and regional organizations to provide timely early warning and vulnerability analysis.



FAMINE EARLY WARNING SYSTEMS NETWORK

3

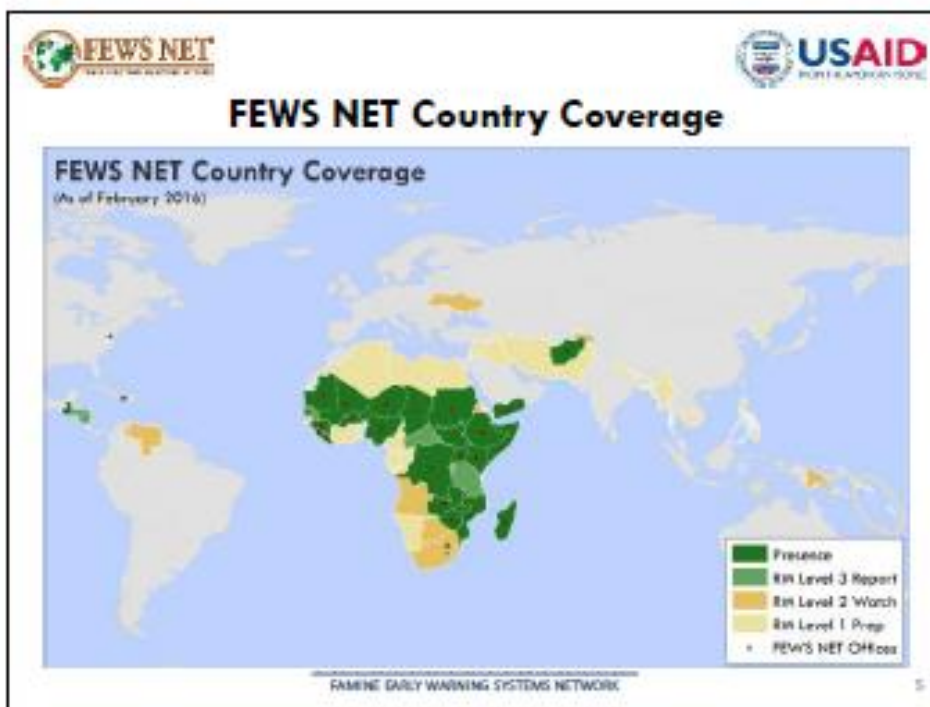



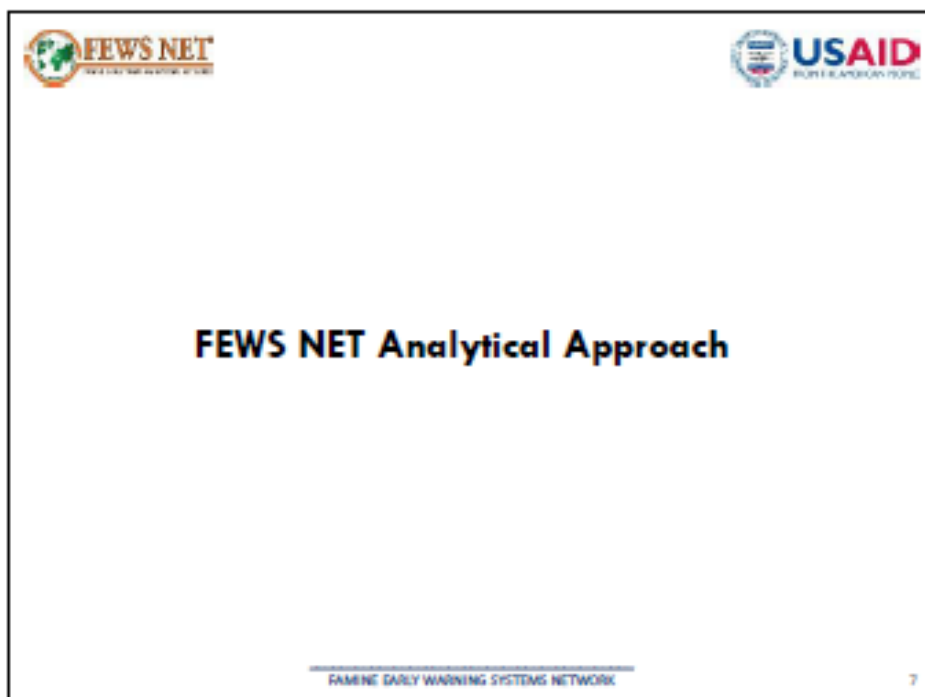
## FEWS NET Fact Sheet

- A USAID-funded project, started in 1985
- Field activities implemented by private sector contractor
- Independent, not a voice for the US Government
- Tracks food security conditions in 70 countries
- Reports monthly on 35 countries, many special reports
- Flexible country coverage
- 200 fulltime staff and 100 field monitors in 25 countries
- Annual budget of approximately \$25m

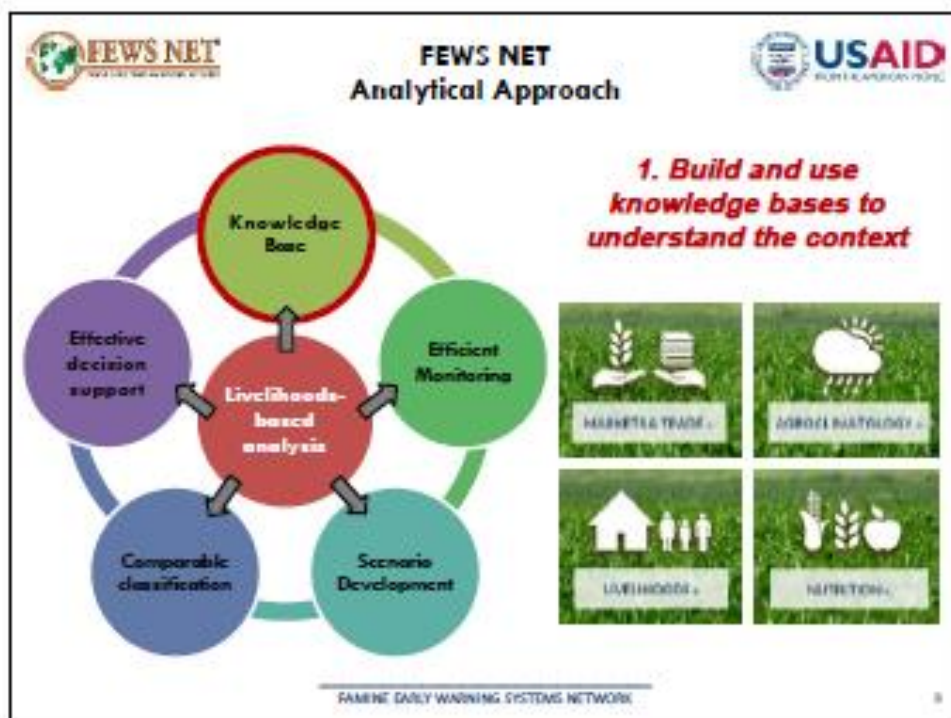
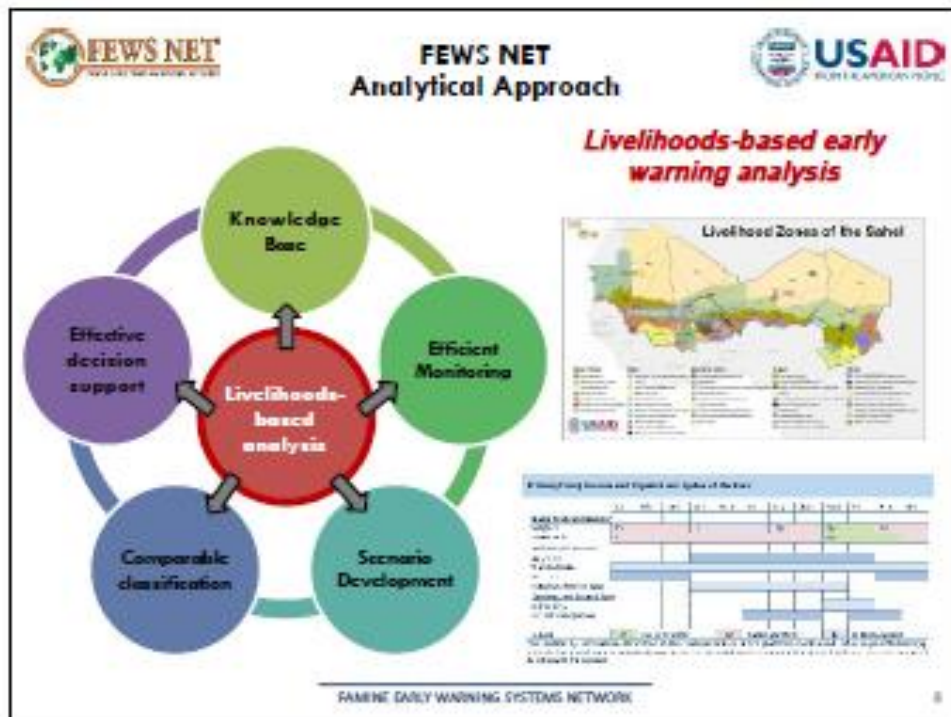
FAMINE EARLY WARNING SYSTEMS NETWORK

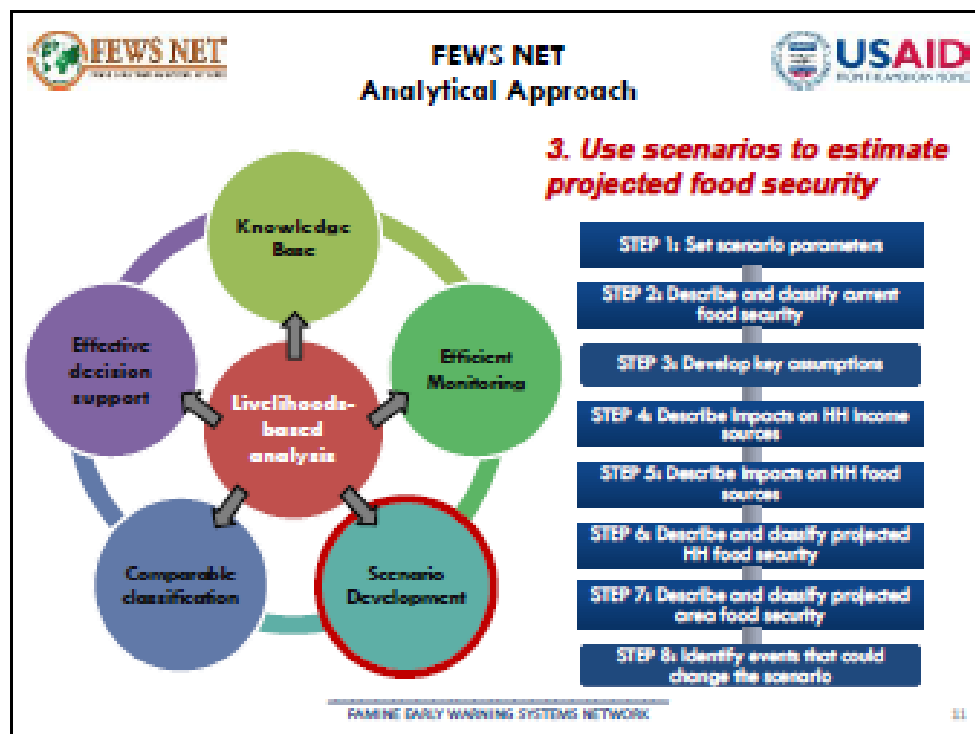
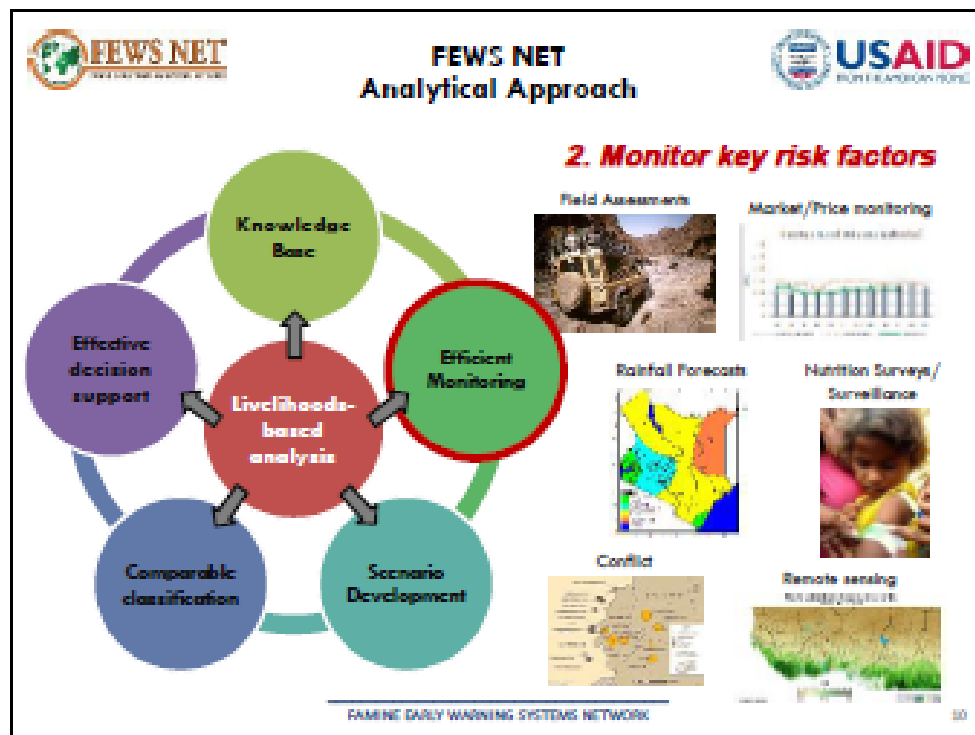
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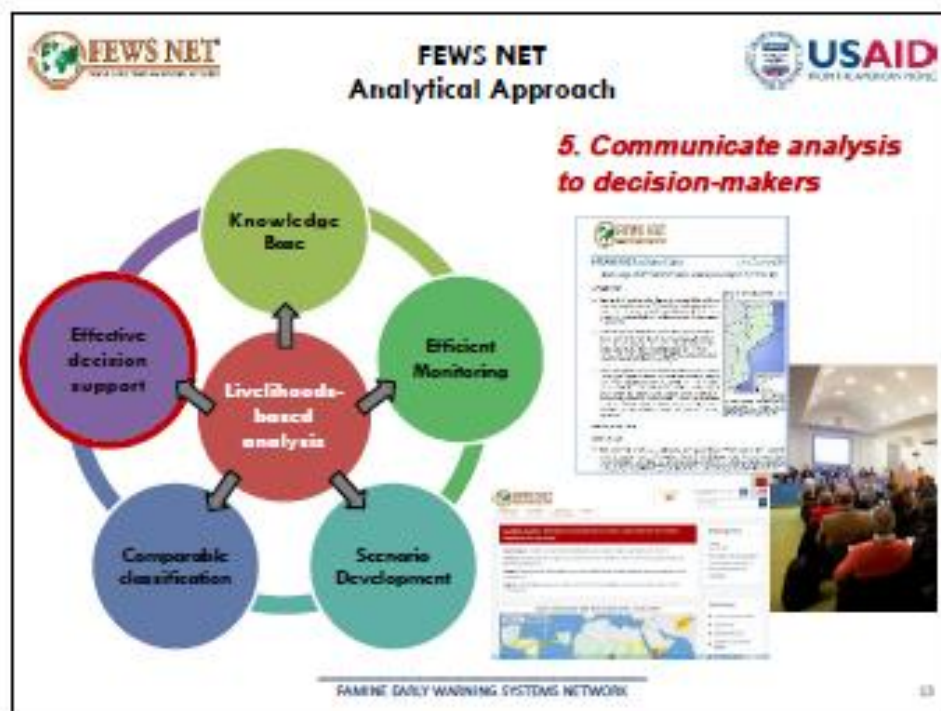
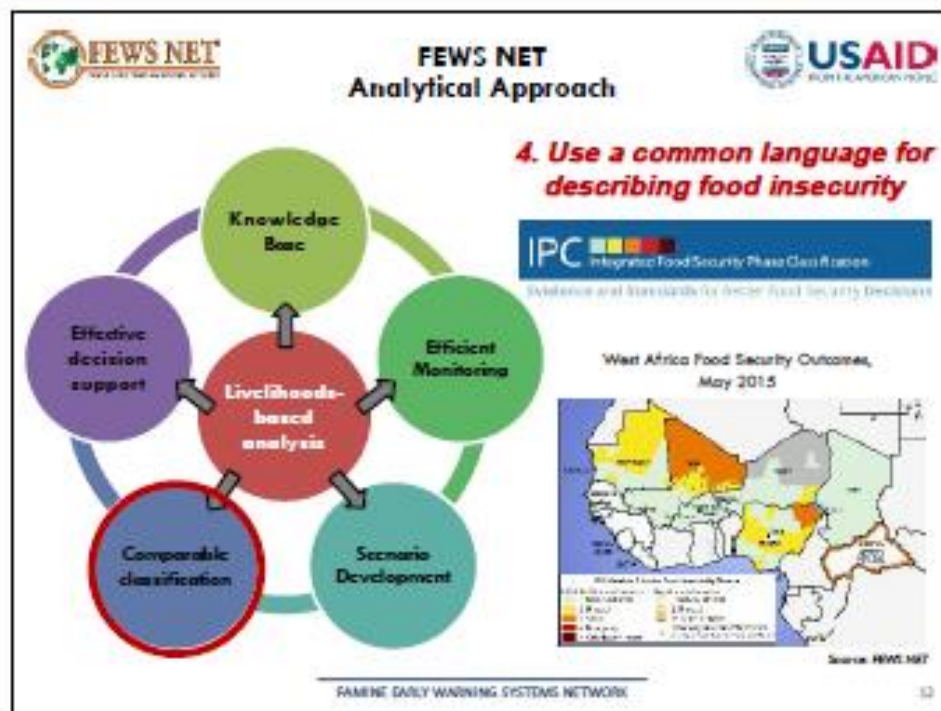


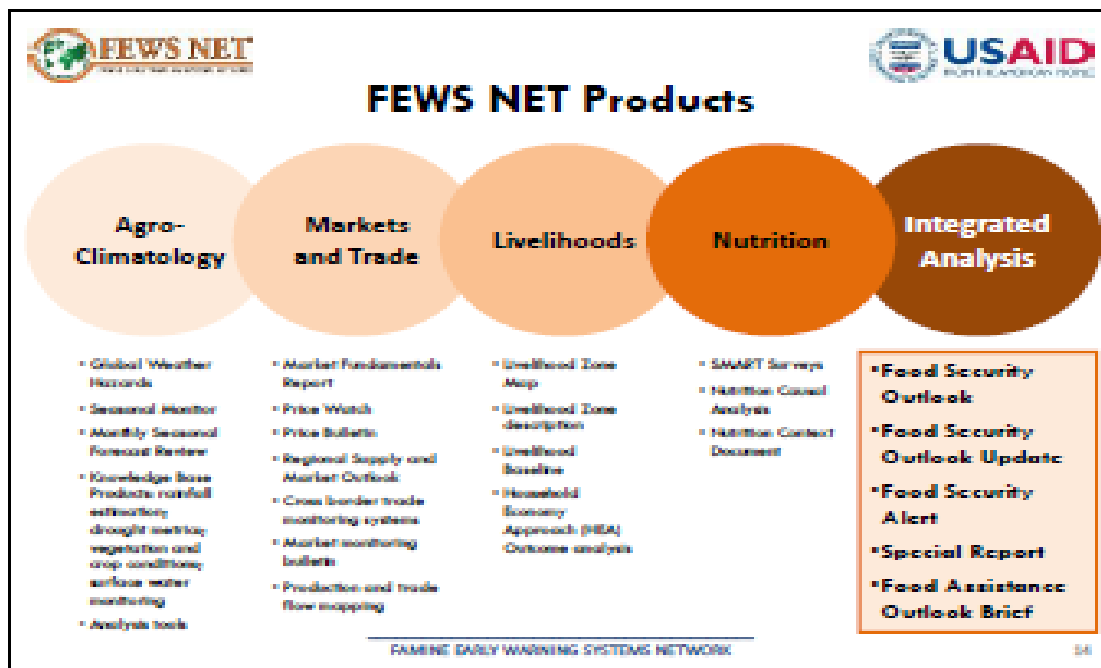














# Questions?

**Bruce Isaacson**  
Chief of Party  
**FEWS NET**

**bisaacson@fews.net**

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FAMINE EARLY WARNING SYSTEMS NETWORK

26



## Presentation 4.3:

### Event Mobile Application (EMA-i): A field reporting digital tool to enhance national disease surveillance systems, FAO/EMPRES

Fairouz Larfaoui, Technical Expert (Veterinarian), FAO



**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**  
*for a world without hunger*



### Event Mobile Application (EMA-i)

*A field reporting digital tool to enhance national disease surveillance systems*

*Fairouz Larfaoui (FAO), Martina Escher (FAO), Alessandro Colonna (FAO),  
Sabina Ramazzotto (FAO), Julio Pinto (FAO).*

Fairouz Larfaoui (DVM, MSc), Technical Expert - FAO – Food Chain Crisis - EMPRES  
Information Systems for Agricultural Risk Management Workshop  
31 January 2017, IFAD HQ, Rome, Italy



### Background – EMPRES-i

Global animal disease information system

- ✓ EMPRES-i was first released by FAO in 2004.
- ✓ A global web-based application to support FAO, veterinary services and the international animal health community by facilitating national, regional and global disease information exchange and risk analyses on new emergent diseases and Transboundary animal diseases.
- ✓ Password-protected with individual privileges.




## EMPRES-i platform

**Public website**  
(English, French, Spanish)



<http://empres-i.fao.org>


**Restricted website (English)**  
**CONFIDENTIAL DATA**




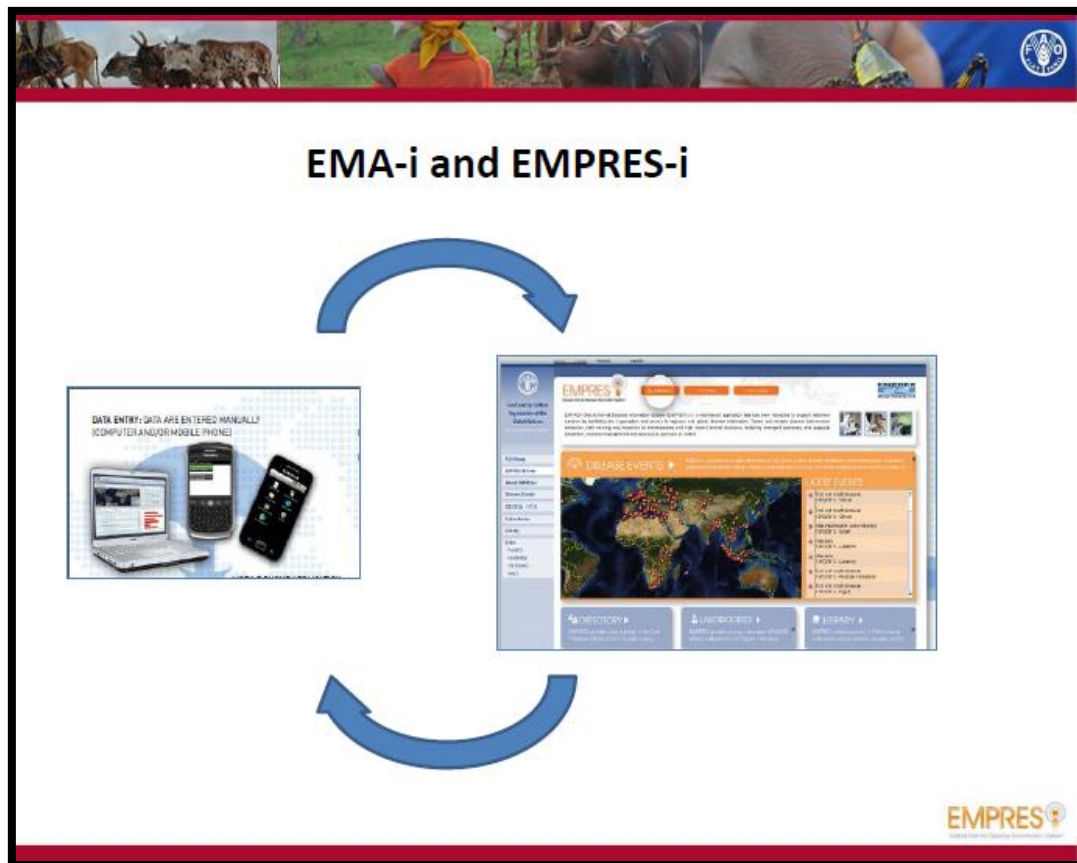
<http://empres-i.fao.org/empres-i3g/>

## Event Mobile Application (EMA-i)

- **To collect** livestock disease data from the field
- To report in **real-time** livestock disease data
- **To safely store** epidemiological data in one database – EMPRES-i platform
- **To access** to reported outbreaks' from a map ("Event Near me")
- **To analyse/visualize** the reported data in charts ("Report Analysis")







## EMA-i – data collection:

- ✓ Data can be collected with or without internet connection
- ✓ Data from an event can be collected in different moments
- ✓ Drafts are saved and stored in the app and can be easily accessed at the user's convenience

**EMPRES-i**



### EMA-i – data collection:

**EMA-i Tanzania - New...**

**GENERAL** | SPECIES | LABORATORY

Latitude: -6.16524

Longitude: 39.1989

Get GPS coordinates

Report Date (dd/mm/yyyy): 26/05/2016

Onset Date (dd/mm/yyyy): 26/05/2016

Surveillance Type: (No selection)

Source of Infection: (No selection)

Save | Overview

**EMA-i Tanzania - New...**

**Species Details**

Animal Family: Mammal

Species: Cattle

Animal Type: Domestic

Production System: Smallholder - Dairy

At Risk: 250 | Cases: 6 | Deaths: 10

Destroyed | Slaughtered | Vaccinated

Confirm | Back

**EMA-i Tanzania - New...**

**SPECIES** | **DISEASE** | LABORATORY

Diagnosis Status: Suspected

Disease: Rabies

No Subtypes Available

Clinical Sign: + | Lesion: +

Dermatitis: Cattle

Interdigital blisters: Cattle

Interdigital vesicles: Cattle

Save | Overview

**EMPRES**

### EMA-i – data collection:

**EMA-i Tanzania - New...**

**DISEASE** | **LABORATORY** | **CONTROL MEASURES**

Disease Tested: Rabies

Laboratory Tests: Add a Test +

26 May, 2016: Pending: Uganda  
histopathological examination, Cattle

Save | Overview

**EMA-i Tanzania - New...**

**LABORATORY** | **CONTROL MEASURES** | **PHOTOS**

Treatments: +

Control Measures: +

Burial

Control of wildlife reservoirs

Save | Overview

**EMA-i Tanzania - New...**

**LABORATORY** | **CONTROL MEASURES** | **PHOTOS**

Photos: Add a Photo +

Save | Overview

## EMA-i – data reporting:

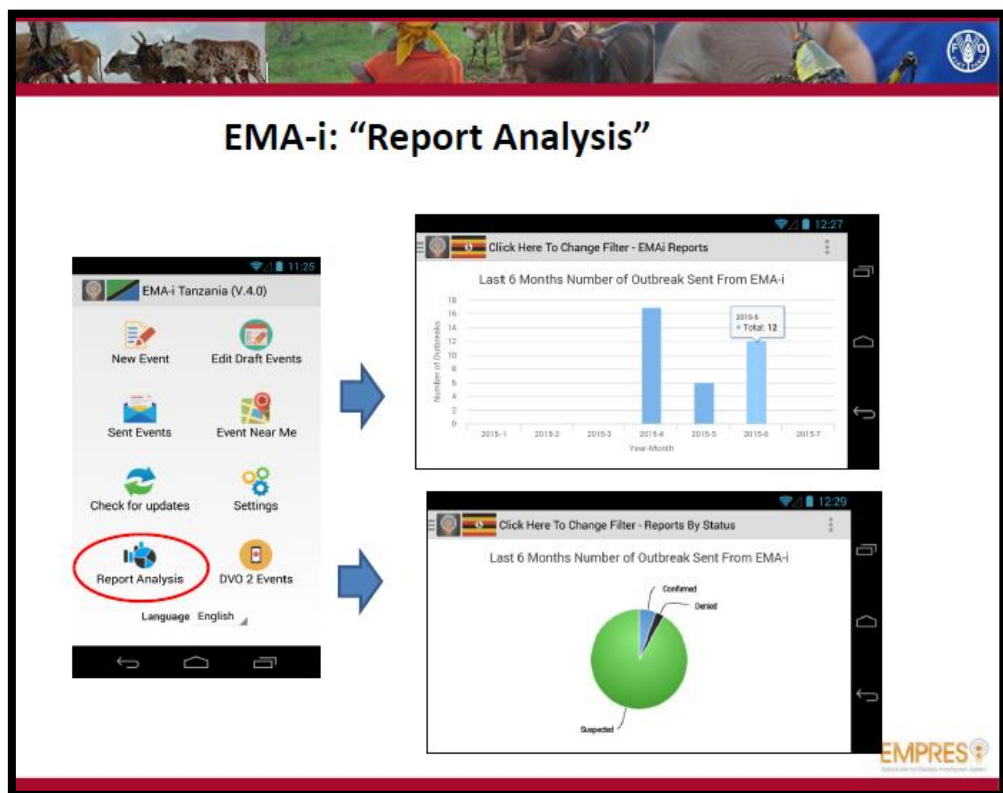
The diagram illustrates the EMA-i data reporting process. It starts with a 'GENERAL' form where users enter details like Latitude (-6.16524), Longitude (39.1989), Report Date (26/05/2016), Onset Date (26/05/2016), Surveillance Type, and Source of Infection. From this form, users can 'Event Overview', 'Save', 'Validate', or 'Send'. The 'Event Overview' screen displays a summary of the event, including General Information (Locality Name: Busia, Latitude: 0.3175316616, Longitude: 34.1824318077, Reporting Date: 11 Feb. 2011, Observation Date: n/a, Surveillance Type: Not specified, Infection Source: Not specified, General Comments: n/a) and Diagnosis Information (Diagnosis: n/a, Status: Confirmed, Disease: African swine fever, Subtypes: n/a, Diagnosis Source: FAO Field Officer). The 'Affected Species' section shows 'Humans' with a status of 'No'. The final screen shows the 'EMA-i Tanzania (V.4.0)' main menu with options: New Event, Edit Draft Events, Sent Events, Event Near Me, Check for updates, Settings, Report Analysis, and DVO 2 Events. A note states: 'Data are sent with internet connection'.

## EMA-i: “Event Near Me”

- To visualize/access the reported outbreaks' in/from a map

The diagram shows the 'Event Near Me' feature. On the left, the 'EMA-i Tanzania (V.4.0)' main menu highlights the 'Event Near Me' option. This leads to a map view showing the region around Uganda, with numerous red location pins indicating reported outbreaks. A blue circle on the map highlights a specific event, which is then shown in detail in the 'Event Overview' screen on the right. This screen displays the same General Information and Diagnosis Information as the first slide, confirming the event details for the selected outbreak.

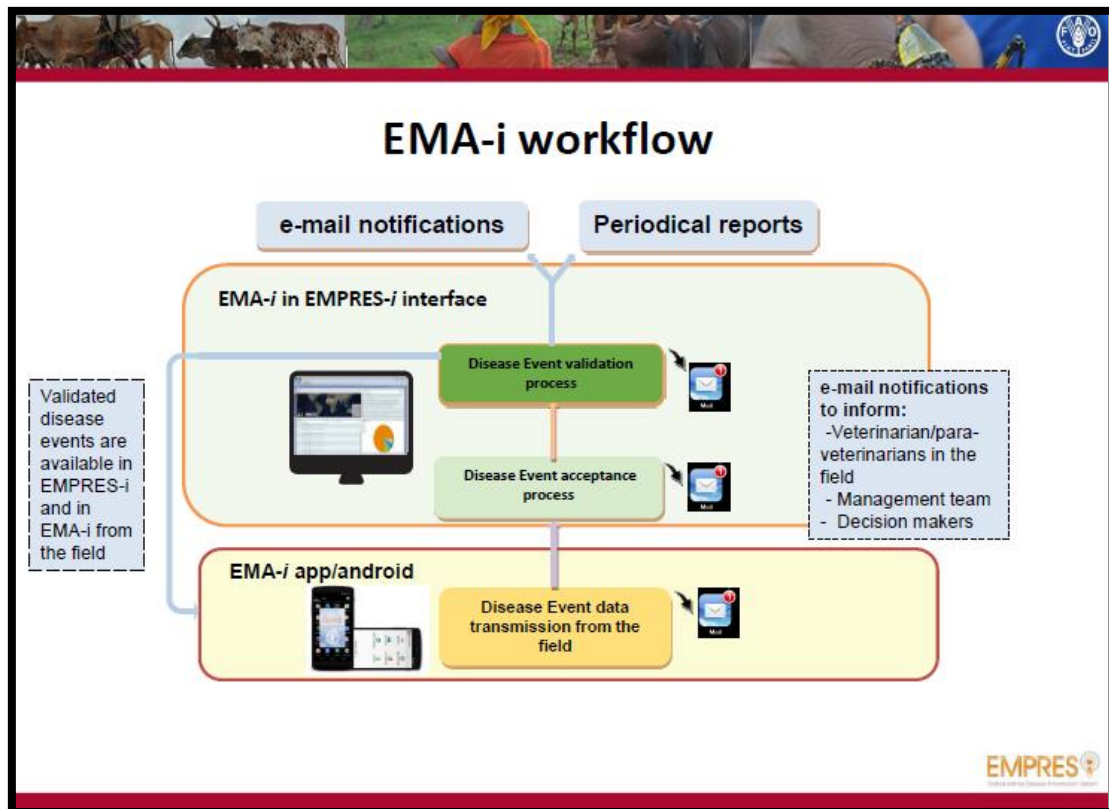




### Methodology - EMA-i at country level

- **STEP 1 - Preparatory phase: adapting EMA-i to the national animal disease surveillance system**
  - Assessment of existing national surveillance and reporting system
  - Agreement on data property (FAO and National authorities)
  - Personnalisation of EMA-i (Actors involved)
  - Procurement (smartphones, internet...)
  - Training programme
- **STEP 2 - Customisation & start-up of EMA-i:**
  - Customisation of EMA-i
  - Training
  - EMA-i/EMPRES-i tested at country level
  - Standard Operational Procedures (SOPs)
- **STEP 3 – Monitoring & Evaluation**
  - Strengths and weaknesses of EMA-i
- **STEP 4 – Improvement of EMA-i**

**EMPRES**



### EMA-i: a pilot activity in Uganda One Health Project (OSRO/GLO/104/IRE)

#### Background

- Follow-up activity of the national workshop on information systems and innovative tools for disease surveillance and reporting held in Entebbe (January 2013).

#### Objective

- To strengthen the existing disease reporting system in Uganda

#### Expected outcomes

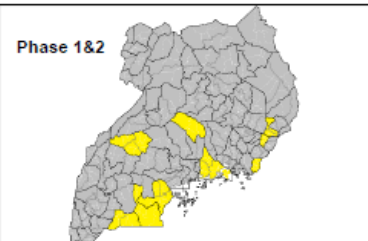
- Improve disease reporting at national level

**EMPRES-i**

## EMA-i: implementation in Uganda (2013-2016)

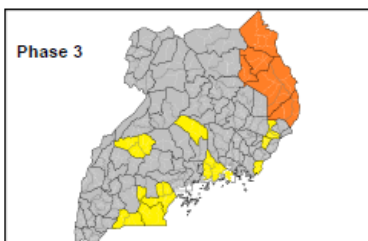
### 1) Phase 1: First implementation (January 2013 – July 2014)

- Preparation and customization: January 2013 - July 2013
- Implementation – 10/112 districts (15 users)
- First evaluation: July 2013 – July 2014



### 2) Phase 2: Second implementation (July 2014 - December 2015)

- Expansion within the 10 districts  
➡ More users (33 users)



### 3) Phase 3: Third implementation (January 2016 -> onward)

- Geographical expansion to **Karamoja Region** (additional 7 districts)

➡ More users & more districts

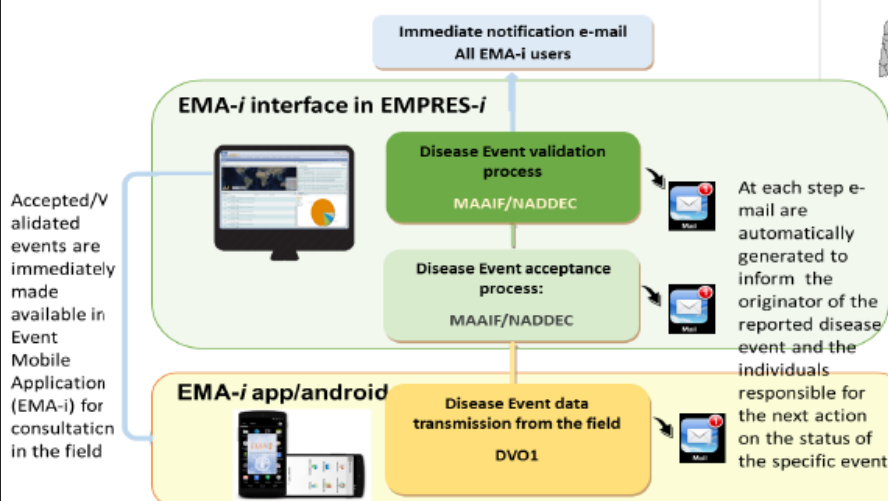
EMPRES

## EMA-i: Phase 1 (July 2013 – July 2014)

**Geographical coverage: 10/112 districts:** Nakasongola, Mbale, Rakai, Sironko, Busia, Lyantonde, Isingiro, Masaka, Mukono, **Mityana, Kibaale**

**EMA-i users:** CVO, NADDEC (n=5), District Veterinary Officers (n=10)

**Customization** - animal diseases collected: 14 diseases



EMPRES



## Phase 1: Results

**Title:** Event Mobile Application (EMA-i): A novel tool for field rapid disease reporting and information sharing

**Authors:** F Larfaoui<sup>1\*</sup>, N Nantima<sup>2</sup>, J Saerugga<sup>3</sup>, A Colonna<sup>1</sup>, S Ramazzotti<sup>1</sup>, S Okoth<sup>2</sup>, J Lubrotti<sup>1</sup>, J Pinto<sup>1</sup>

<sup>1</sup>Food and Agricultural Organization of the United Nations (FAO), Rome, Italy  
<sup>2</sup>Food and Agricultural Organization of the United Nations (FAO), Nairobi, Kenya  
<sup>3</sup>National Animal and Disease Diagnostic and Epidemiology Center (NADDEC), Entebbe, Uganda

\* [Farfaoui@fao.org](mailto:Farfaoui@fao.org)

**Keywords:** Mobile applications, Public Health, Zoonoses, Animal diseases, Surveillance, Data reporting

Oral presentation preferred.

**Summary:**

**Background/Introduction:** Early detection and timely reporting of animal diseases including zoonoses, are a challenge in developing countries, where weak infrastructure, human resources and capacities have an impact to effectively implement adequate disease surveillance and reporting. FAO has developed an Event Mobile Application (EMA-i) for data collection and real-time reporting. EMA-i has been piloted in Uganda to support veterinary services to improve the existing surveillance system.

**Materials and methods:** EMA-i was customized for the national animal health authorities, a workflow was established according to the existing reporting procedure from the field to the decision makers and

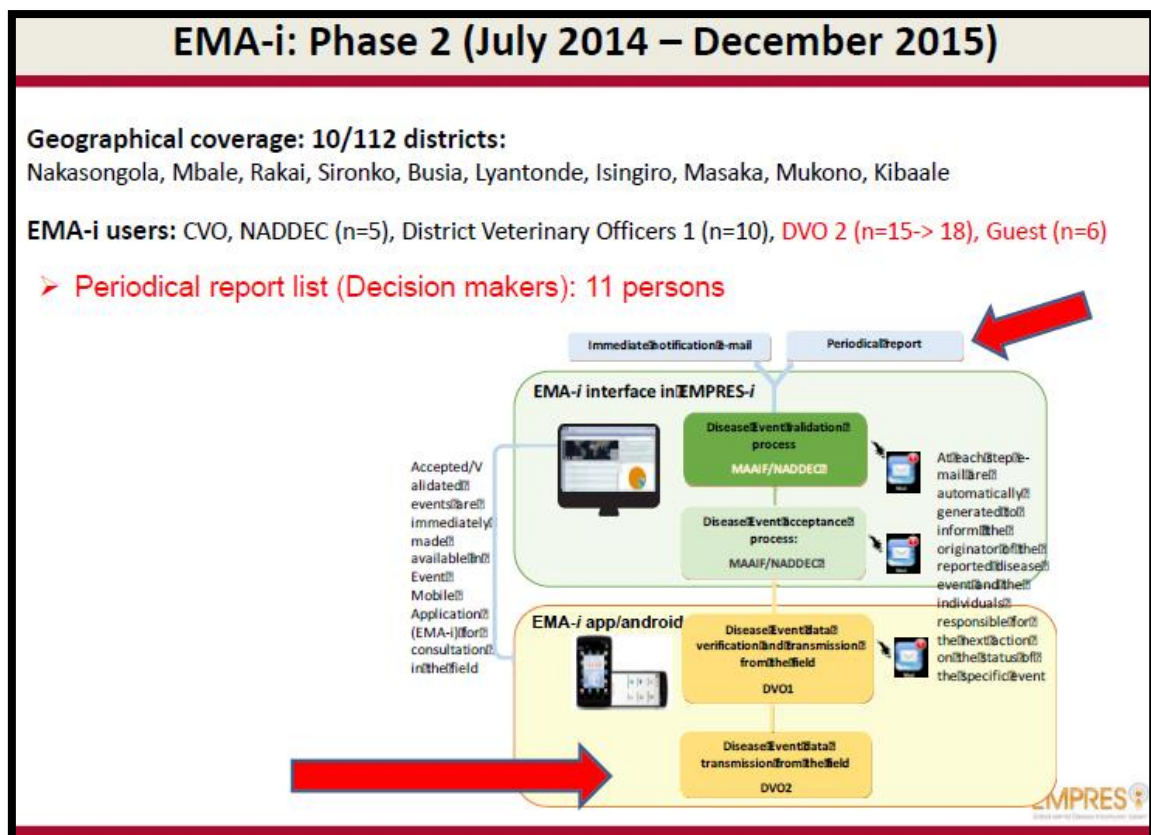
NADDEC. After validation, reports from EMPRES-i are sent to the CVO, NADDEC and DVOs.

**Results and Conclusion:** Ten districts out of 112 and 16 diseases were selected including zoonosis such as anthrax, brucellosis, Rift Valley fever, trypanosomiasis and rabies. From July 2013 to December 2013, 126 livestock reports were submitted to NADDEC compared to 45 in 2012 and 56 in 2011. Piloting EMA-i in Uganda clearly shows the improvements in reporting time (i.e. from weeks to minutes) from districts and in having a wide range of diseases reported, better interaction and communication between the field and decision makers.

FAO is supporting developing countries in the implementation of EMA-i and providing

“From July 2013 to December 2013, **126 livestock reports** were submitted to NADDEC compared to 45 in 2012 and 56 in 2011”.

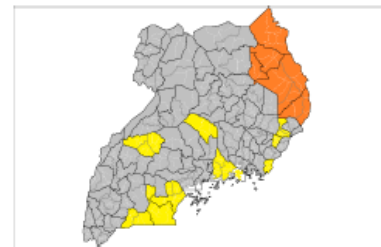
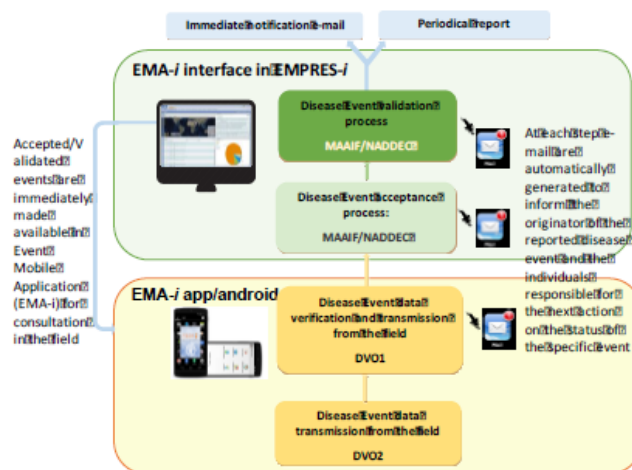
**EMPRES-i**



## EMA-i: Phase 3: Expansion (December 2015 – onward)

**Geographical coverage: 17/112 districts:** Nakasongola, Mbale, Rakai, Sironko, Busia, Lyantonde, Isingiro, Masaka, Mukono, Kibaale + Kaabong, Kotido, Abin, Moroto, Napak, Amudat, Nakapiripirit (Karamoja)

**EMA-i users:** CVO, NADDEC (n=32, acceptance (n=8), validation (n=24), District Veterinary Officers 1 (n=23), DVO 2 (n=110), Guests (n=6)



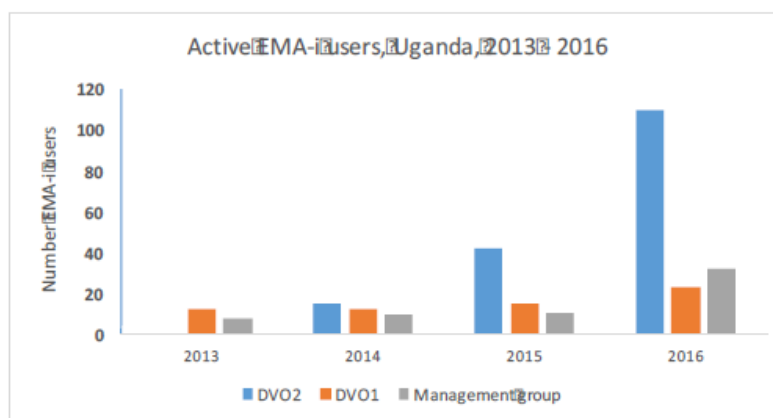
EMPRES-i  
Global Animal Disease Information System

## Uganda: Overall results since July 2013

### EMA-i active users: 162 Animal Health Officers

- 110 DVO 2
- 20 DVO 1
- 32 from the Management Group (NADDEC):
  - 18 Verification
  - 20 Validation

1,158 disease events reported/sent with EMA-i !



EMPRES-i  
Global Animal Disease Information System





## EMA-i Mali

- Period of implementation: November 2016-April 2017
- 3/11 districts : Koulikoro, Kayes et Sikasso
- Number of users: 25 (districts) + 10 (Management)






## EMA-i Zanzibar (Tanzania)

- Period of implementation: June 2016 – February 2017 (on-going)
- All the Island (11 districts)
- Number of users: 35 veterinarians/paraveterinarians

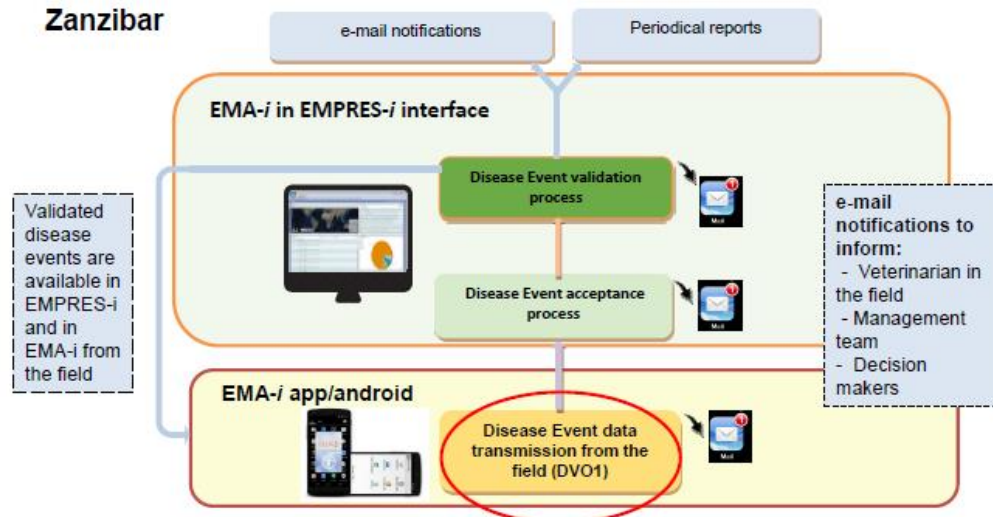






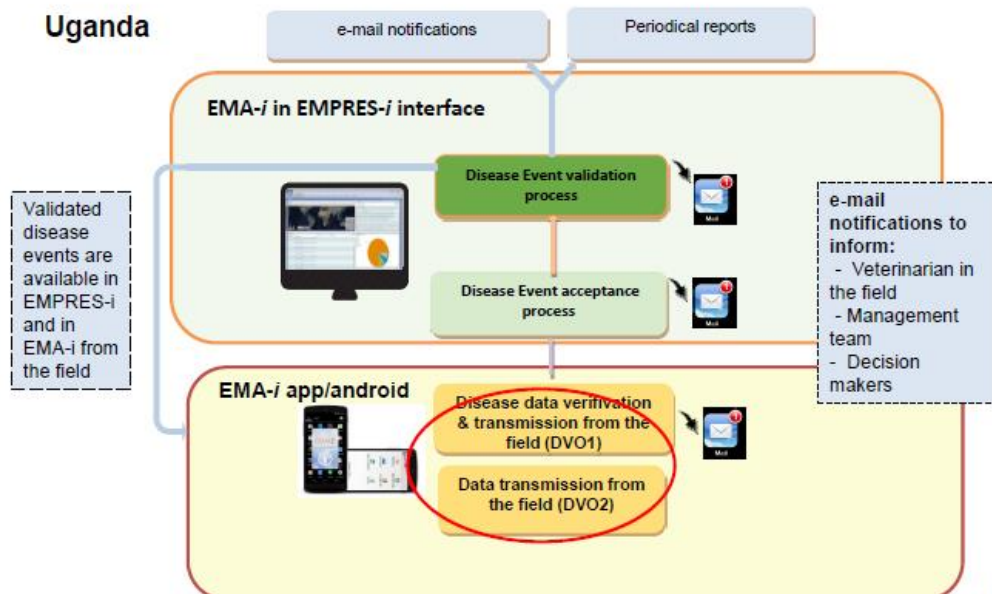

## EMA-i - flexible tool

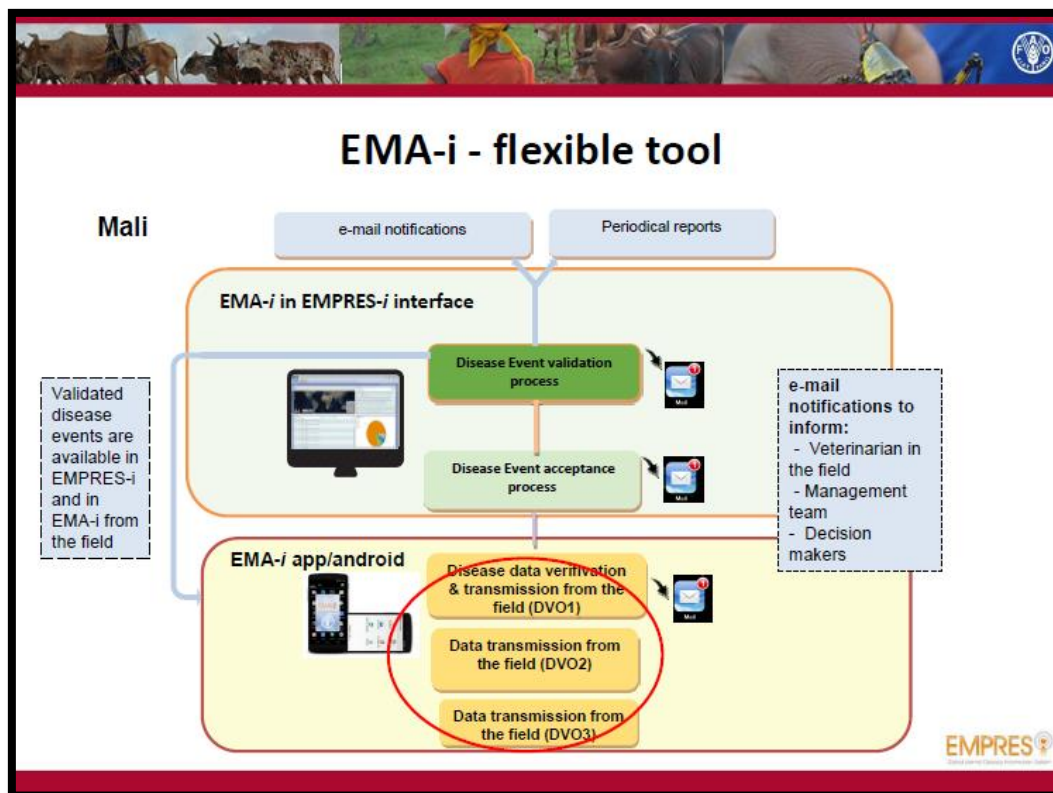
### Zanzibar





## EMA-i - flexible tool

### Uganda











## Thank you!

**EMA-i contacts :**

Julio Pinto (FAO - GLEWS): [Julio.pinto@fao.org](mailto:Julio.pinto@fao.org)  
Martina Escher (FAO - GLEWS): [Martina.Escher@fao.org](mailto:Martina.Escher@fao.org)  
Alessandro Colonna (FAO – GLEWS/CIO): [Alessandro.Colonna@fao.org](mailto:Alessandro.Colonna@fao.org)  
Sabina Ramazzotto (FAO-FLEWS/CIO): [Sabina.Ramazotto@fao.org](mailto:Sabina.Ramazotto@fao.org)  
Fairouz Larfaoui (FAO – FCC EMPRES): [Fairouz.Larfaoui@fao.org](mailto:Fairouz.Larfaoui@fao.org)

**Links:**  
[empres-i@fao.org](mailto:empres-i@fao.org)  
<http://empres-i.fao.org/empresi3g>  
<http://empres-i.fao.org>





## TOPIC 5: From Global market to Farmer's gate

The idea behind this group is to understand how different levels of particular information for risk management could reach client. It combines presenters of tool at the national, regional and international level, solely on market as the case study for the showcase. It differs from the topic one, which is more of mixed themes – presenters from different areas of risk.

Presentation 5.1: Agricultural Market Information System (AMIS)  
Abdolreza Abbassian, Senior Economist, FAO

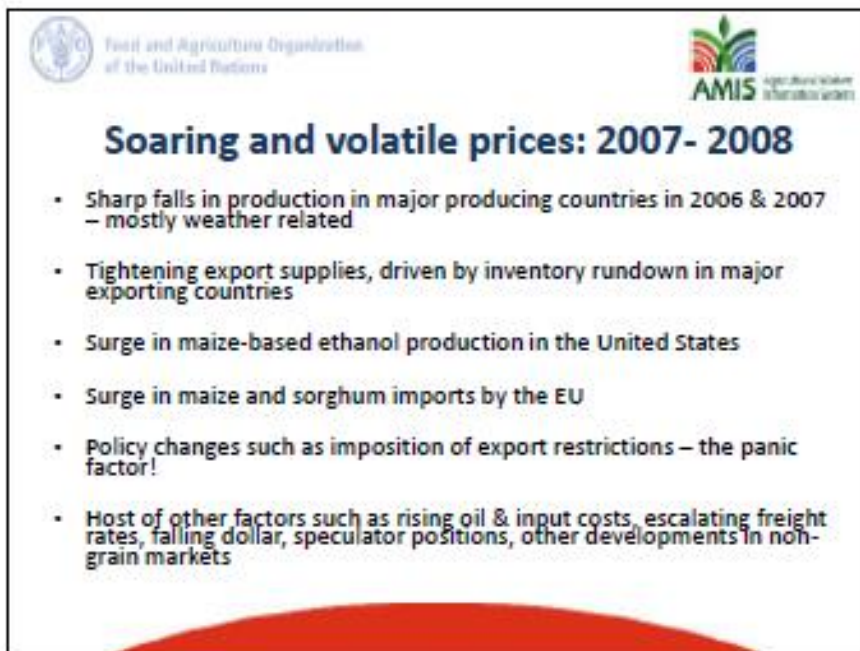
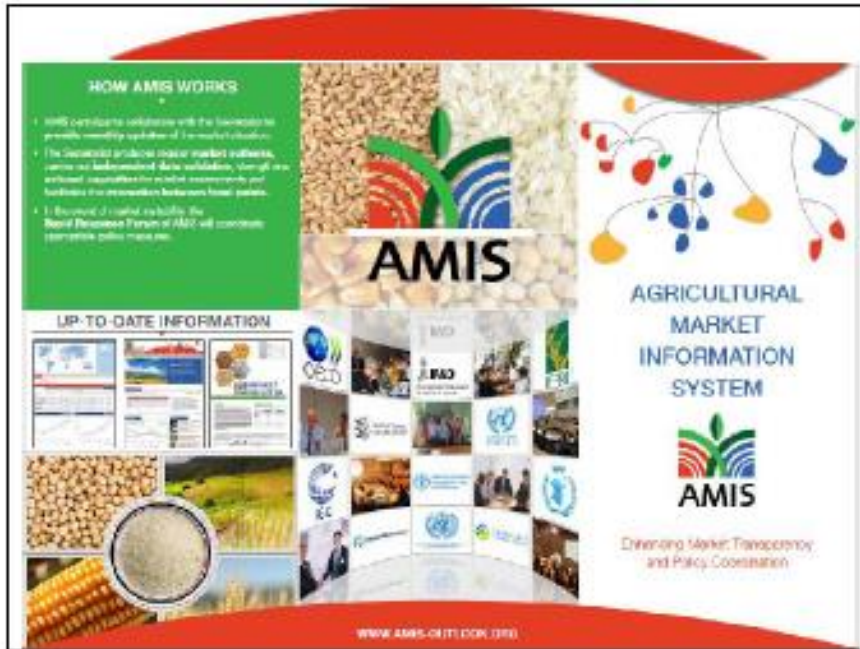
### **Others without ppt: (Contact presenters for details)**

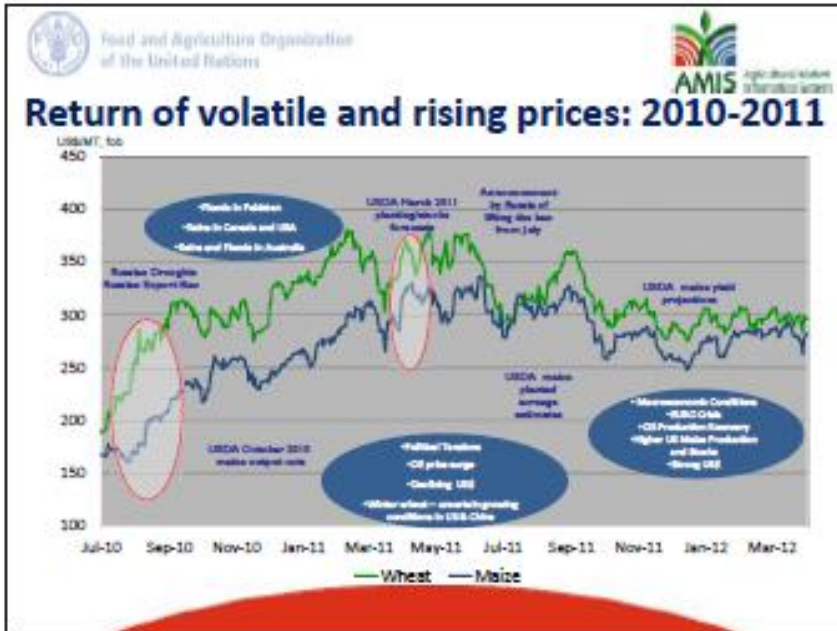
Presentation 5.2: EAGC-RATIN  
Gerald Makau Masila, Executive Director, Eastern Africa Grain Council (EAGC)

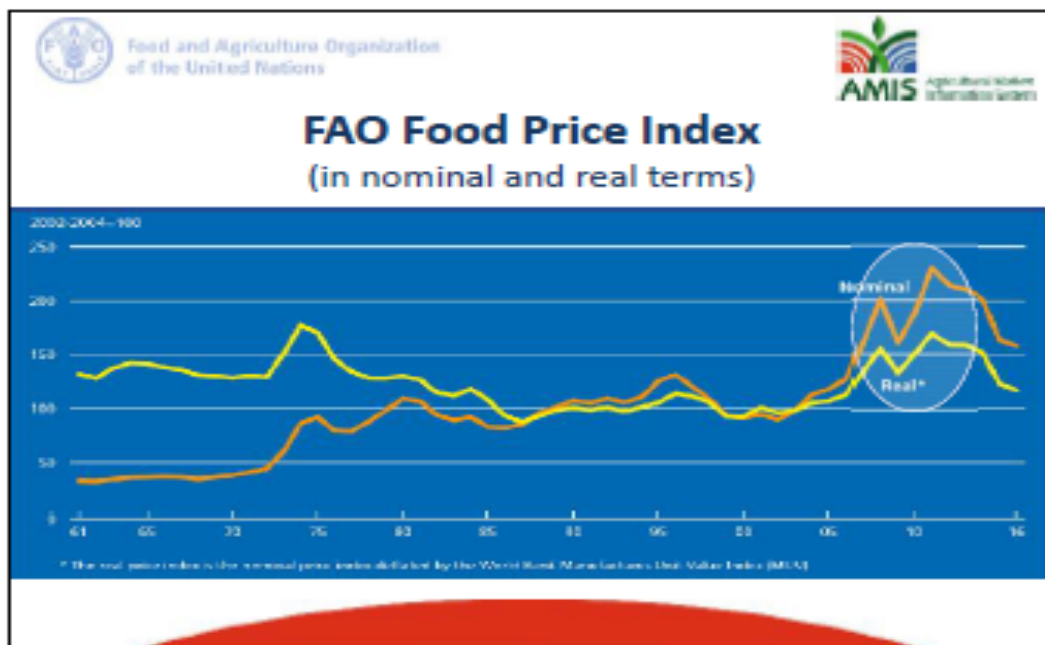
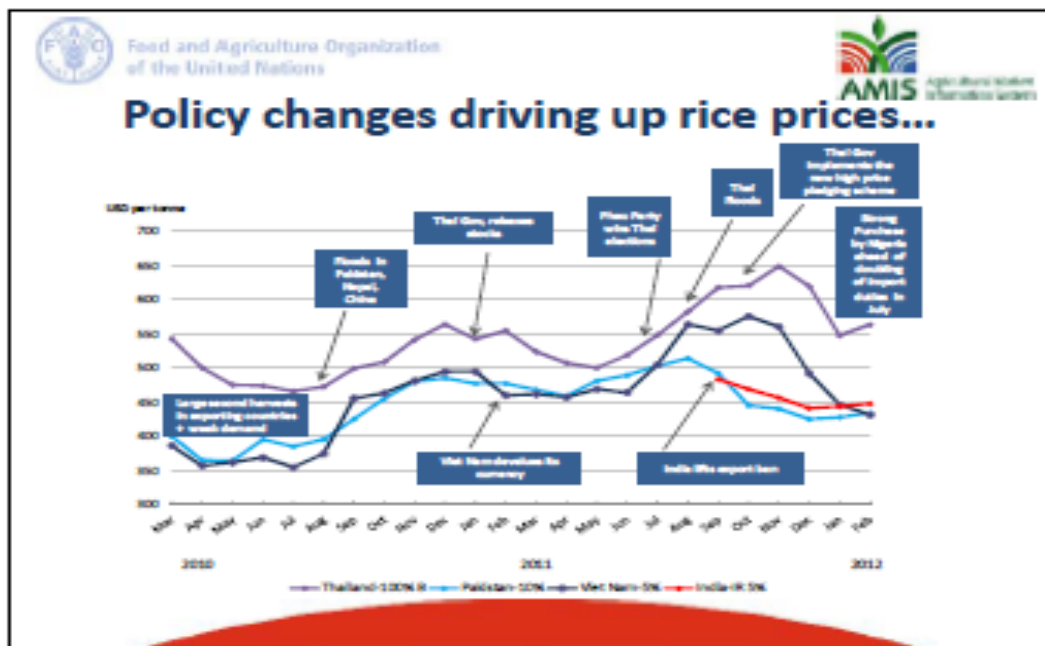
Presentation 5.3: PAFA-YEGLE platform  
Steven Jonckheere, Knowledge Mgt and M&E Officer, IFAD



Abdolreza Abbassian, Senior Economist, FAO









Food and Agriculture Organization  
of the United Nations



## Markets in 2007-2011

- Shrinking food reserves (cereal stocks) & increased dependence on imports (more reliance on international markets)
- Erratic outputs/supplies from new production zones such as the Russian Federation and Ukraine (adding to price volatility)
- Growing links with “outside markets” (such as energy and financial markets)
- Restrictive trade measures (as opposed to export subsidies)
- Unfavourable climatic conditions



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of the United Nations



## Key problems for AMIS to address!

- Lack of reliable and up-to-date information regarding the world supply and demand condition
- Partly due to weaknesses at national level to produce consistent, accurate and timely forecasts
- Inadequate information on stocks
- Inappropriate and/or uncoordinated national policy responses to global market developments



Food and Agriculture Organization  
of the United Nations



## What is AMIS?

- An inter-agency platform to enhance food market transparency and reduce the likelihood of food price volatility
- Launched by G20 Ministers of Agriculture in 2011
- Target crops:    
- Focus: production, utilization, stocks, trade
- Participants: G20 Members + Spain and 7 invited countries
- AMIS Secretariat: eleven international organizations and entities:



9



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## Global coverage



● G20 Members & Spain

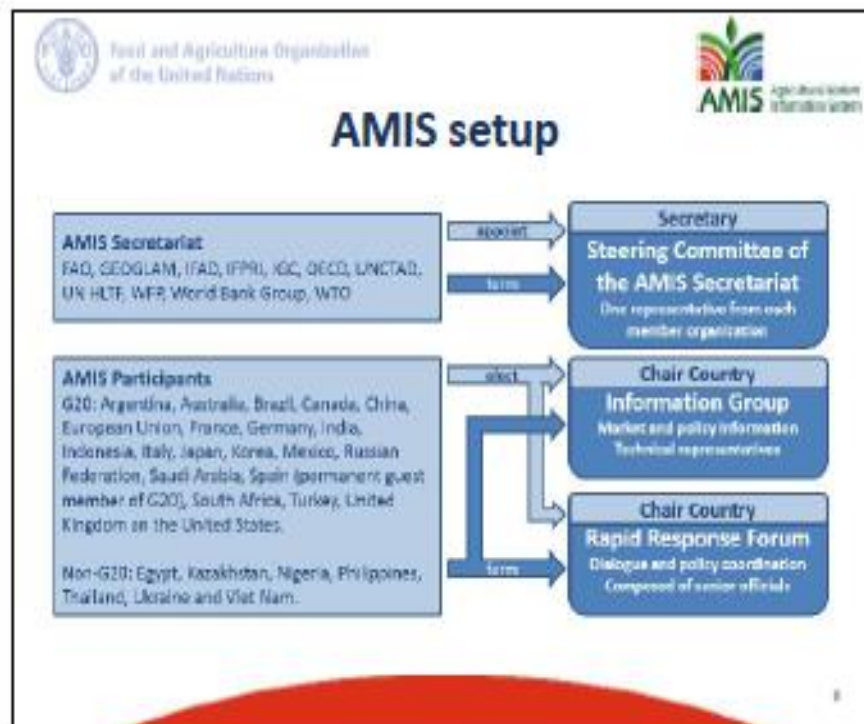
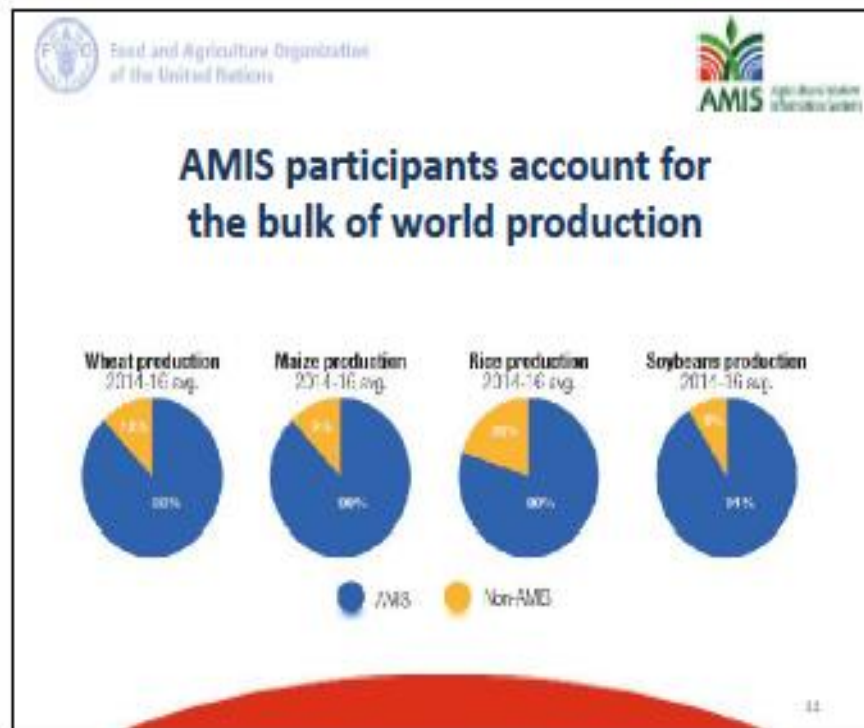
● Other EU Members\*

● Invited countries

\* Not participating in AMIS as individual countries, but collectively represented by the European Union

30







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of the United Nations



AMIS  
Agricultural Market  
Information System

## OUTPUTS

- **Market Monitor** – assessing the global market situation and outlook for the AMIS crops.
- **Indicator Portal** – featuring key measures to identify critical market conditions that might require policy action.
- **Market Database** – providing the latest forecasts on production, consumption, trade and stocks.
- **Policy Database** – compiling information on policies that might impact on global food markets.
- **AMIS website** – offering a comprehensive overview of AMIS outputs and activities.
- **Capacity building** – supporting countries to produce better market information.

10



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AMIS  
Agricultural Market  
Information System

## What has been achieved so far?



The slide, titled "And in terms of the AMIS objectives?", features the FAO and AMIS logos at the top. The title is in a bold, dark blue font. Below the title, four bullet points are listed, each preceded by a dark blue circular marker:

- Provide timely information on supply and demand balances
- Address weaknesses of national data providers
- Improve knowledge on stocks
- Coordinate policy responses



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## Overcoming the lack of information




UPDATED AND RELEASED MONTHLY

33



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## Addressing weaknesses at national level

- **Capacity development projects** in Bangladesh, India, Nigeria, Philippines, Thailand
- **Training of focal points** from China, India, Indonesia, Kazakhstan, South Africa, Thailand and Viet Nam
- **Release of reference materials** on international best practices
- **Workshops and seminars** on selected topics







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## Improving knowledge on stocks

- **Two international experts meetings** on stocks measurement (London, Nov 2014 and Beijing, Jul 2015)
- Stocks measurement a main component in the **India project** (workshop in Nov 2016)
- Release of a database on **international best practices**
- Publication of **guidelines for stocks measurement** (in review)





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## Coordinating policy responses

- **Relatively calm international markets** since 2011
- No need for an extraordinary session of the **AMIS Rapid Response Forum**
- Regular meetings with focal points to **build a strong network**
- Establish the necessary structures to **effectively address future crises**









## TOPIC 6: Getting information from the crowd

To maintain reliable information, one requires credible and direct/point source for empirical facts about the happenings on the ground. Initiatives/tools in this group focus mainly on crowdsourcing. Presenters seeks to showcase tools that are used in gathering, maintaining and processing direct information from sources and to disseminate the processed information to the receiving clients.

Presentation 6.1: Farm Records Management Information System (FARMIS), USAID  
James Nguo Regional Director, Arid Lands Information Network

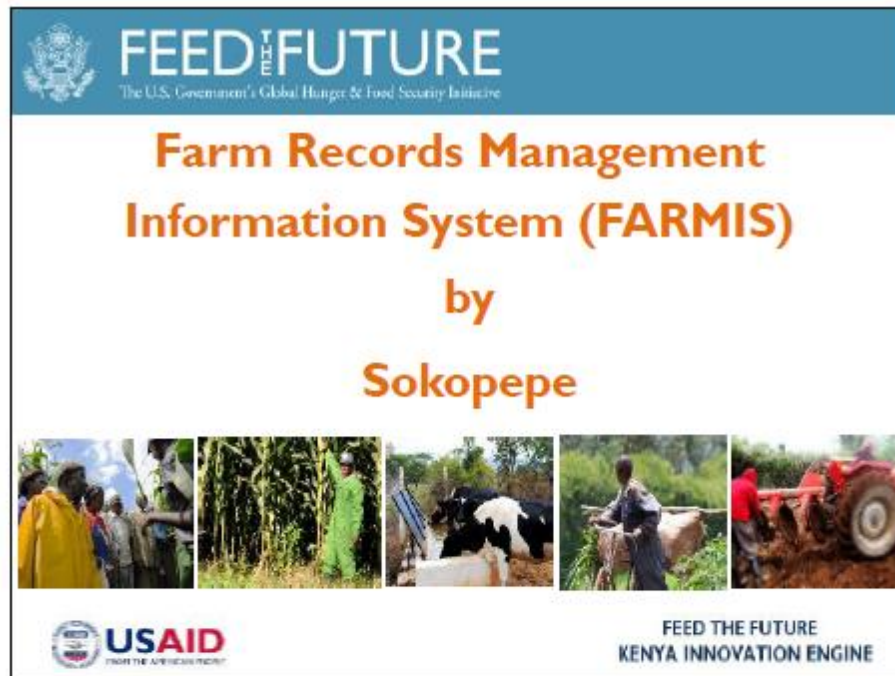
Presentation 6.2: PEAT Plantix  
Charlotte Shumann, Business Development Officer, PEAT  
Alexander Kennepohl, Geodata and Plant Pathology Officer, PEAT

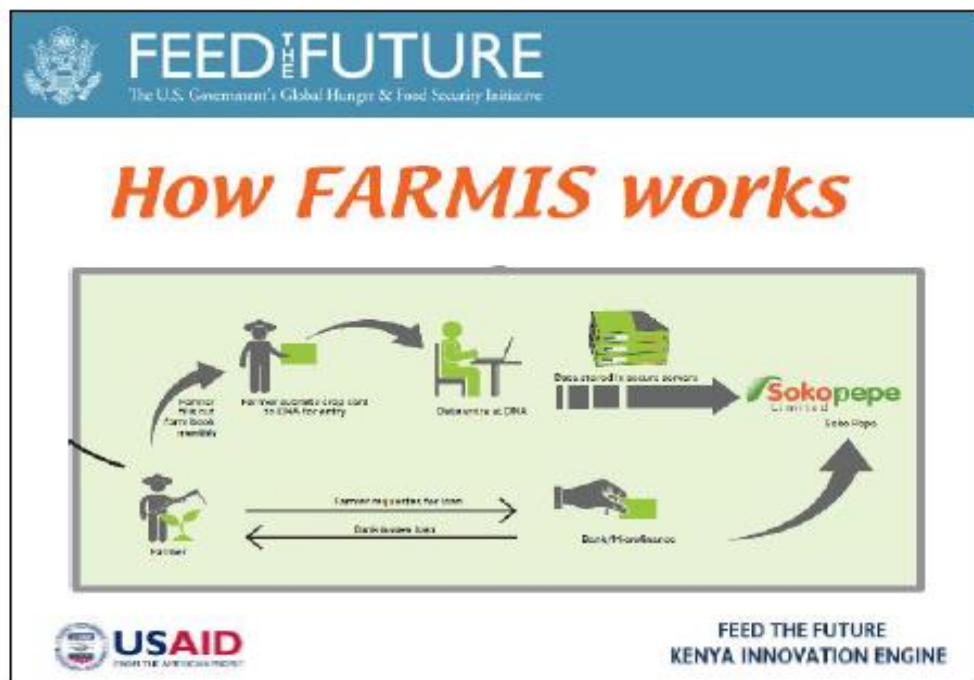
Presentation 6.3: Innovative food price collection: focus crowdsourcing in Africa  
Gloria Solano Hermosilla, Economist, JRC

## Presentation 6.1:

### Farm Records Management Information System (FARMIS), USAID

James Nguo Regional Director, Arid Lands Information Network (ALIN)






**FEED THE FUTURE**  
The U.S. Government's Global Hunger & Food Security Initiative

### Proof of concept stage

- ✓ **STTA:**
  - Customization of the FARMIS software
  - Development of business and governance plans
- ✓ **Field activities;**
  - Use of Production Information Agents (PIAs) to profile farmers and provide extension services
  - Training farmers to use farm records
- ✓ **Outputs and outcomes**
  - Database of 5,400 farmers applying the innovation
  - An agricultural production report for 5 sub-counties in Meru County to help the county government in policy and decision making.
  - 29 production information agents under employment hence job creation
  - Recommended for graduation

**USAID**  
FROM THE AMERICAN PEOPLE

**FEED THE FUTURE  
KENYA INNOVATION ENGINE**




# FEED THE FUTURE


The U.S. Government's Global Hunger & Food Security Initiative

## Plans for Stage 2

- ✓ 20,000 farmers (7,000 women and 13,000 men) applying the innovation -
- ✓ 120,000 (60,000 women and 60,000 men) directly benefiting from the innovation
- ✓ US\$120,000 - Income by the end of Stage 2 – Pilot Rollout
- ✓ 5000 farmers accessing formal markets
- ✓ 10 new organisational partnerships
- ✓ Linkage with service providers along the value chain: finance and input providers
- ✓ 2 agriculture production reports


**USAID**  
FROM THE AMERICAN PEOPLE

**FEED THE FUTURE**  
**KENYA INNOVATION ENGINE**




# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

## Finance

Financial Indicators	no of farmers	7000	20,000.00	36,000.00	64,800.00	116,640.00	209,952.00
Transaction		Current level (\$)	Projected level Yr 1 (\$)	Projected level Yr 2 (\$)	Projected level Yr 3 (\$)	Projected level Yr 4 (\$)	Projected level Yr 5 (\$)
Turnover	a	150,000.00	10,000,000.00	18,000,000.00	32,400,000.00	58,320,000.00	104,976,000.00
Other Income		-	3,000,000.00	4,500,000.00	6,750,000.00	10,125,000.00	15,187,500.00
Cost of Sales (	b	400,000.00	800,000.00	1,440,000.00	2,592,000.00	4,665,600.00	8,398,080.00
<b>Gross Profit</b>	<b>c = (a-b)</b>	<b>(250,000.00)</b>	<b>12,200,000.00</b>	<b>21,060,000.00</b>	<b>36,558,000.00</b>	<b>63,779,400.00</b>	<b>111,765,420.00</b>
Gross profit margin as a %	$d = ((a-b)/a) * 100$	-167%	92%	92%	92%	92%	92%
Operating expenses	e	7,500,000.00	49,000,000.00	49,000,000.00	53,900,000.00	59,290,000.00	80,041,500.00
Net profit (EBITDA)	$f = (c-e)$	(7,750,000.00)	(36,800,000.00)	(27,940,000.00)	(17,342,000.00)	4,489,400.00	31,723,920.00
Net profit margin as a %	$g = f/a * 100$	-5167%	-368%	-155%	-54%	8%	30%


**USAID**  
FROM THE AMERICAN PEOPLE

**FEED THE FUTURE**  
**KENYA INNOVATION ENGINE**





# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

## Impact and sustainability

### Business

- ✓ 20,000 at US\$5 hence US\$100,000 from farmers
- ✓ Partnership with Meru County Government for focused extension services including e-Extension, as well as other stakeholders for mutual benefits
- ✓ Operational governance plan
- ✓ Advertising, data vending, data analytics

### Farmer-level impact

- ✓ 20,000 farmers having evidence base for decision making
- ✓ A culture of farm records keeping strengthened
- ✓ Access to market



FEED THE FUTURE  
KENYA INNOVATION ENGINE

## Presentation 6.2:


### PEAT Plantix

Charlotte Shumann, Business Development Officer, PEAT

Alexander Kennepohl, Geodata and Plant Pathology Officer, PEAT



## ● Vision



Artificial intelligence  
will boost  
human capacity

## ● Global Challenge



15-30%

of the annual yield worldwide is lost  
due to plant diseases and pests

ref: FAO // Oerke 2006

## ● Image Recognition



Automatic Image Recognition of Plant Diseases, Pests and Nutrient Deficiencies

4

## ● 1 Software in 3 solutions



Automatic image recognition  
of plant diseases & pests

Smartphone  
Application

Software  
Interface

Geostatistics

5



## Our App Plantix

Start      Picture      Selection      Treatment

Identify and treat plant damages in a quick & simple manner

6

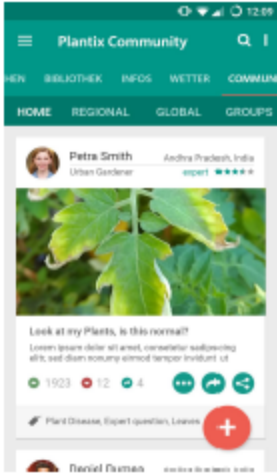
## Adaptation for Farmers' Benefit

"The app is an impressive example on how AI can benefit society"

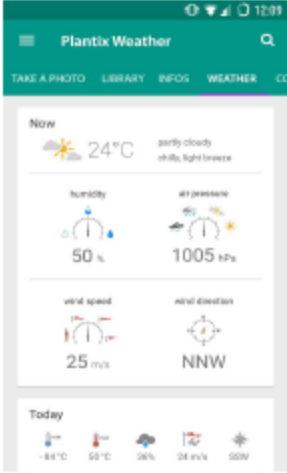
Prof. Patrick Baudisch, Head of Human Computer Interaction Hasso-Plattner-Institut  
@business-on.de




## Roll Out in India April 2017



Plantix - Community  
Connects farmers  
all over the world



Plantix - Weather  
With integrated  
disease alerts

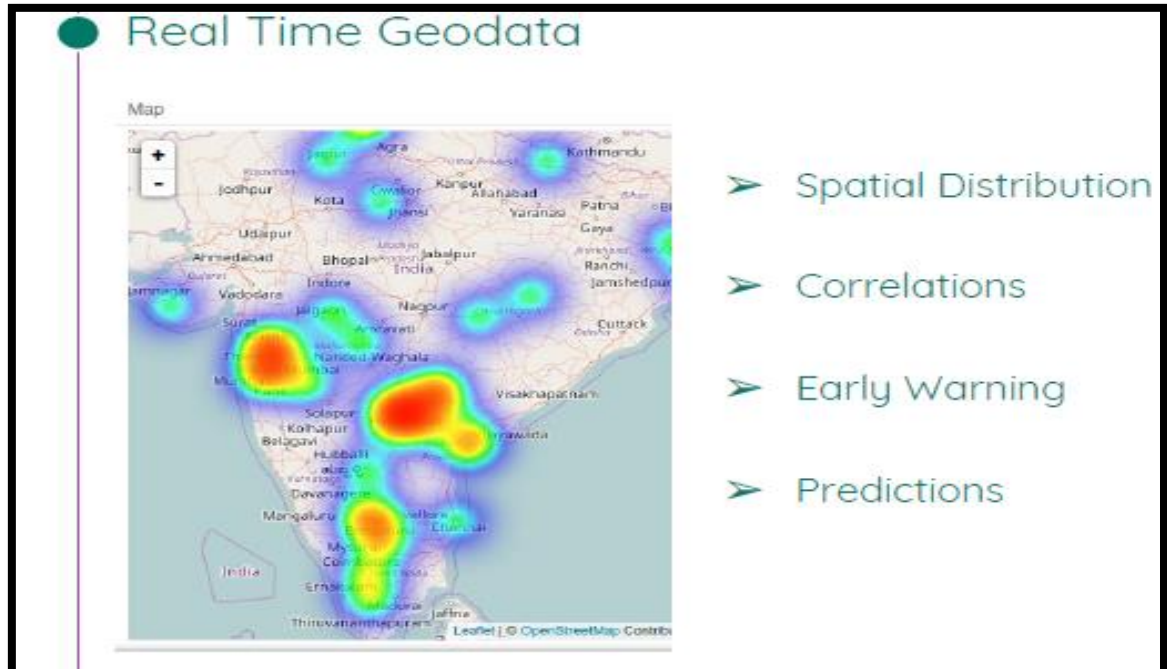
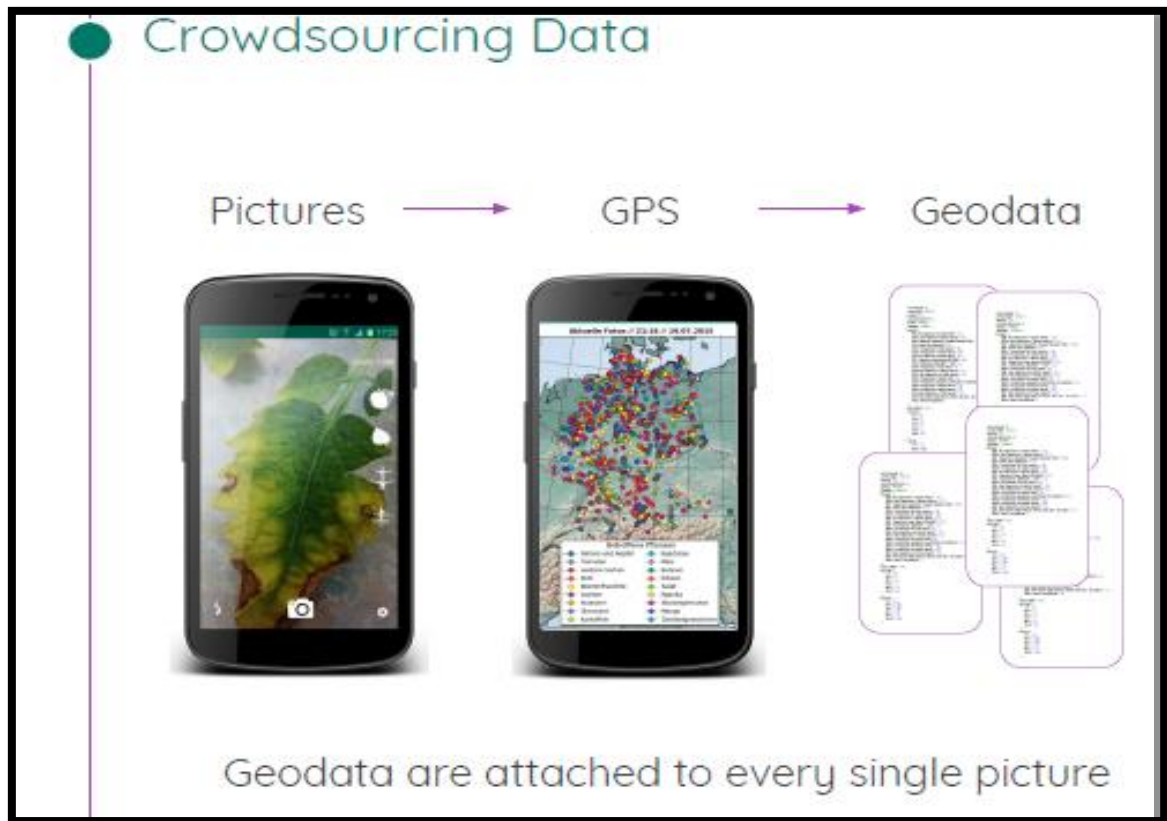


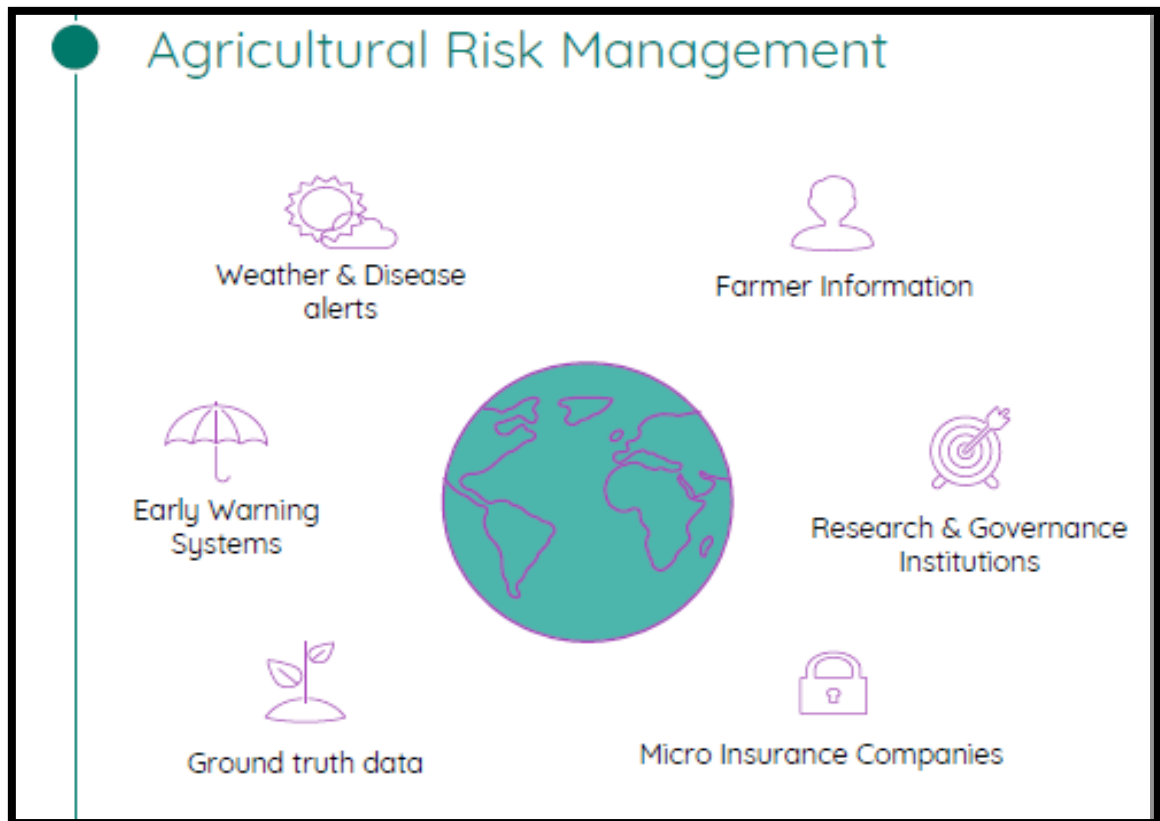
Plantix - Crop Calendar  
Individual guide through  
the whole cropping  
season

## Plantix success story



- Over 100 plant damages can be automatically recognized
- Currently over 100 000 sessions per month
- Detailed descriptions of over 300 plant damages in our library
- Database contains more than 250 000 labeled pictures





Progressive Environmental & Agricultural Technologies

**Download Plantix  
& Test us now**

find us at  
[peat.ai](https://peat.ai) & [plantix.net](https://plantix.net)  
[contact@peat.ai](mailto:contact@peat.ai)  
 Playstore: Plantix

Gefördert durch:

aufgrund eines Beschlusses  
des Deutschen Bundestages

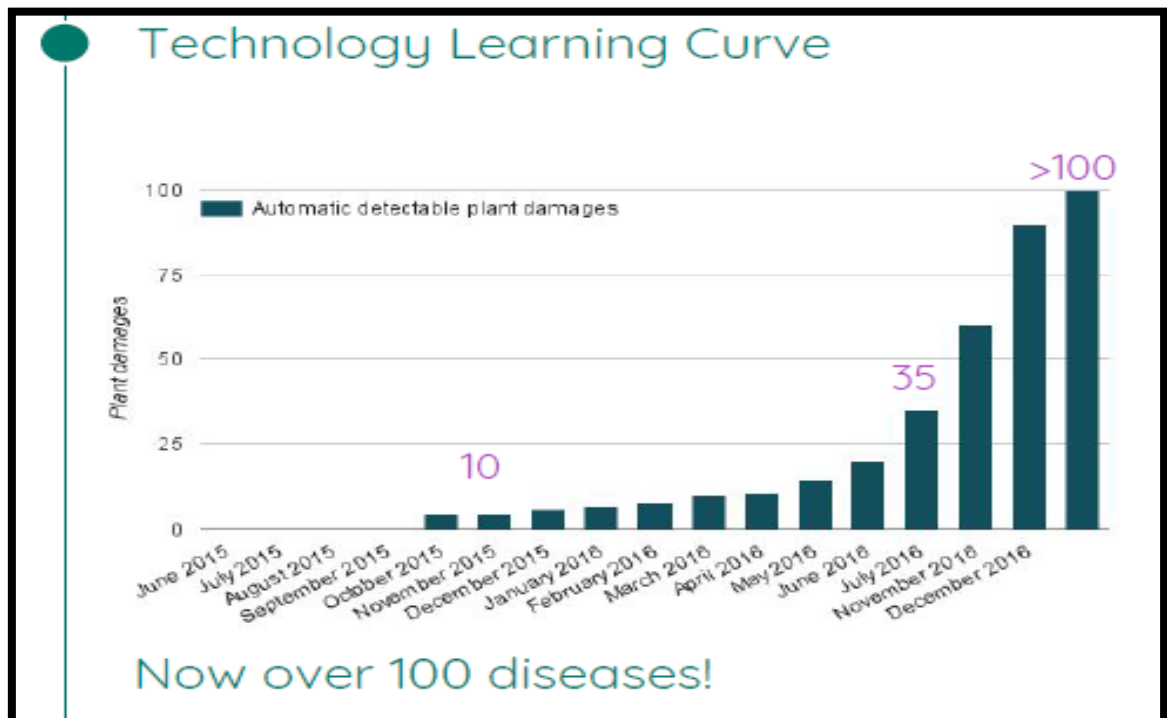
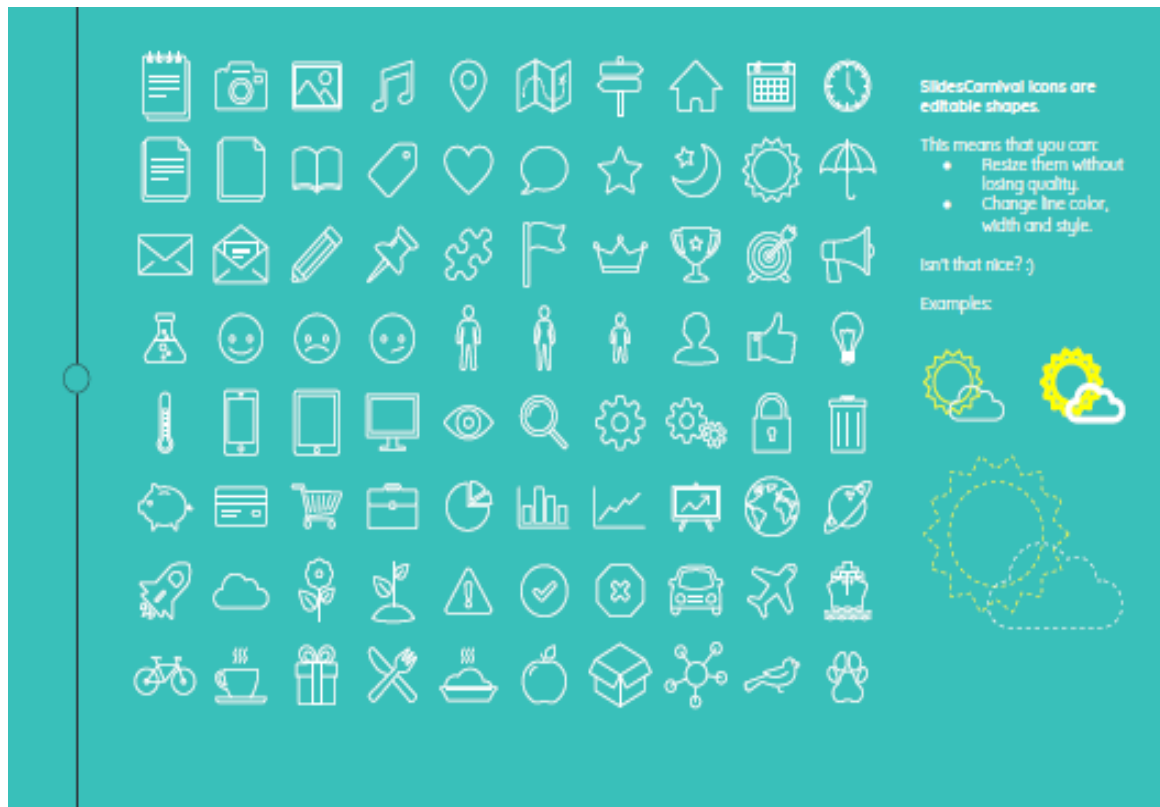
**eXIST**

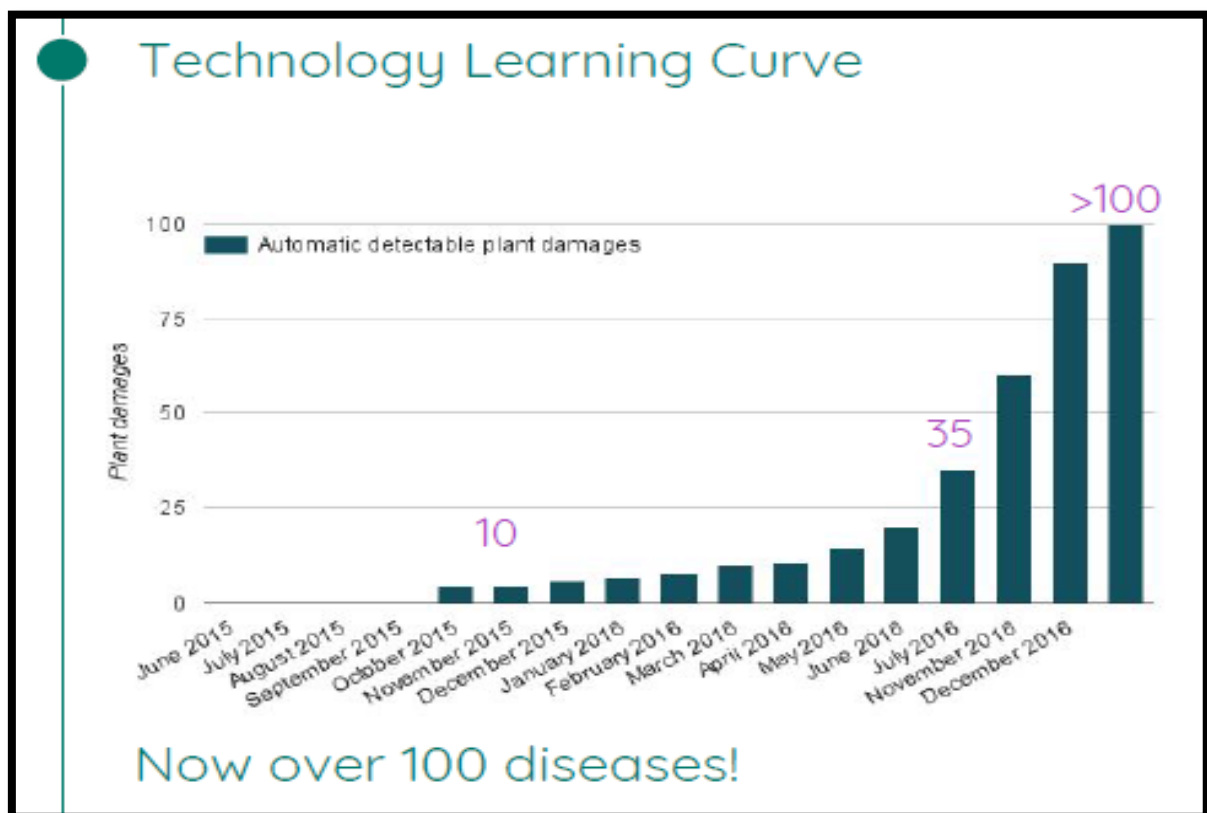
Existenzgründungen  
aus der Wissenschaft

**ESF**

Europäischer Sozialfonds  
für Deutschland

**EUROPÄISCHE UNION**



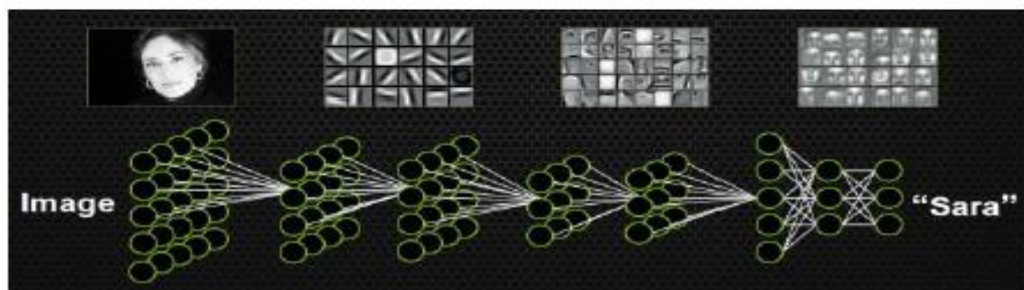




## ● Roll Out in India April 2017



## ● Deep Neural Networks



## Feedback



"I have recently downloaded your app. It's a great idea. It's like a portable lab."

Chaitanya Ghandi, Farmer in Maharashtra

*"Die Anwendung zeigt eindrucksvoll, wie maschinelles Lernen einen Nutzen für die Gesellschaft bieten kann."*

(Patrick Baudisch, Leiter Human Computer Interaction am Hasso-Plattner-Institut in Berlin-Brandenburg @business-on.de)



*"this solution provides the last-mile connectivity that enables farmers to deal with the impact of a changing climate."*

(Manju Bansal, vice president and global program head at SAP Startup Focus @MIT Technology Review US)

*"Software will eat the world, but the world will eat better due to PEAT's software."*

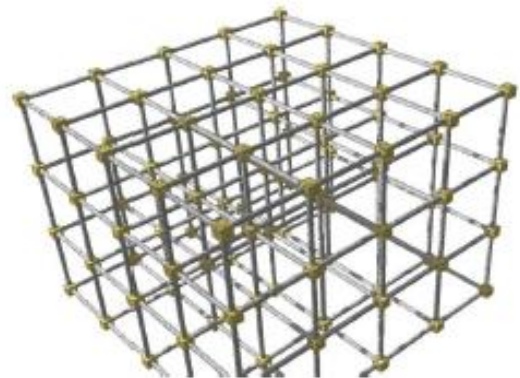
(CTO Rob Strey in Anlehnung an Marc Andreessen @big thinking in PEAT's office)





## ● Frameworks

- Frontend: Java
- Backend: Python
- Flask
- Android SDK
- Caffe
- Tensorflow
- Firebase
- Mongo DB



## ● Hardware

- Frontend: Smartphones
- Backend:
- 2 NVIDIA TITAN X GPUs
- Platform: CUDA



## ● Was wollen wir von denen?

### Was wollen wir

- Partnerschaft zum nutzen der Inhalte
- Austausch über räumliche Verteilung von Pflanzenkrankheiten
- Austausch auf unserem Forum
- Plant Doc / Plant Clinics können sich bei uns registrieren und sich dort organisieren

### Was bekommt cabi

- ein tool zum verbreiten von deren Knowledge
- Zugang zu unseren geodaten (processed) gerne mit verlinkung auf die seite
- Mehr visibility und reichweite für Clinics und Cabi



## Presentation 6.3:

### Innovative food price collection: focus crowdsourcing in Africa

Gloria Solano Hermosilla, Economist, JRC



## The European Commission's science and knowledge service

Joint Research Centre

### Outline

#### Methodological study (JRC-Terranea)

1. Objectives
2. The Approach
3. Crowdsourcing
4. The survey and interviews
5. Conclusions and Recommendations



### Objectives

„... to gain insights in innovative price data collection methods (i.e. crowdsourcing) and existing initiatives, ... to better understand if crowdsourcing methods...provide reliable results for collecting food price data in Africa.“

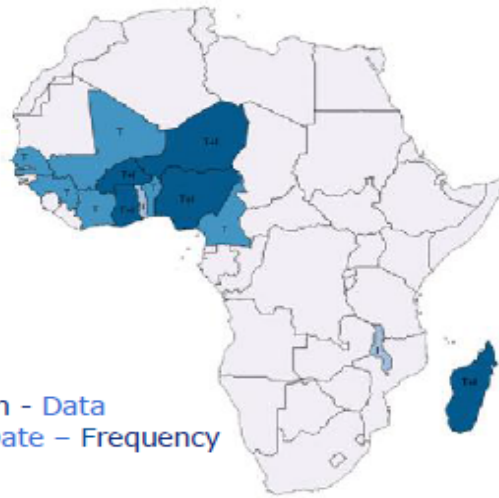
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## Approach

- Literature review
- Online survey
- Personal interviews

Institutional set up - Data collection - Data dissemination - Data validation - Date - Frequency  
Time gap - Cost drivers - Funding  
Pros/Cons of technology



5

EOXPLORE

terranea



European Commission

## Potentials of crowdsourcing

- Collection and processing of data
- A possible large number of volunteers difficult and expensive to engage formally
- Specific local geographic expertise
- Has potential for global development, improving earnings and livelihoods in poor communities



Espen Sundve - Crowd;  
<https://www.flickr.com/photos/sundve/3744159600/>  
<https://creativecommons.org/licenses/by-sa/2.0/>

6

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European Commission

## The Challenges of crowdsourcing

- Process not effective
- Communication with the crowd
- No active crowd
- Incentives/ rewarding system
- Data quality
- Capacity of crowd
- Management of contributions
- Cheap labour without regulation, labour rights and standards or minimum wages

7

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## Conclusions & recommendations

Enabling environment

8

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## Stay in touch



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## The Survey and Interviews

Nr	Name	Sector	Country	Data collection includes
1	Novus Agro	Private industry	Nigeria	Smartphone App, SMS
2	ACE	Private Industry	Malawi	Smartphone App, SMS
3	Observatoire du Riz	National Government	Madagascar	SMS
4	SIM CPC	NGO	Togo	SMS
5	SIMA	National Government	Niger	SMS
6	Rongéad	NGO	Cote d'Ivoire	SMS, other
7	Farmerline	Private industry	Ghana	SMS
8	Sonagess	National Government	Burkina Faso	Smart phone App, SMS
9	Esoko	Private industry	Ghana	Smart phone App, SMS





**The European Commission's  
science and knowledge service**

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**Africa Food Price  
Collection Project (coop.  
JRC-AfDB-Knoema)**

**Approaching real-time  
data and crowdsourcing**

Presentation: Gloria Solano Hermosilla  
(JRC-Seville), Robert M'barek (JRC-Seville)



## Project overview

- ✓ **Objective:** Timely, high frequency, cost-efficient and open food prices through hired collectors
- ✓ **Scope and time-frame:**
  - 20 African countries (JRC) (crowdsourcing in 3: Kenya, Uganda, Sierra Leone); expanded to 53 countries (AfDB)
  - National & regional coverage (1 to 2 markets per country) ~150 markets
  - 25 commodities (food & energy) (ICP)
  - Weekly collection & release
  - Time-frame: JRC 2014-2015
- ✓ **Partners:**
- ✓ **Implementation:** Web-based and mobile-based platform for submitting data and piloting crowdsourcing
- ✓ **Outcome:**
  - Online database weekly prices (collection on-going funded by AfDB until Jan 2017)
  - Fully operational website available to the public for free

### ONLINE DATABASE

<http://africafoodprices.io/>



AFRICA FOOD PRICES COLLECTION

2

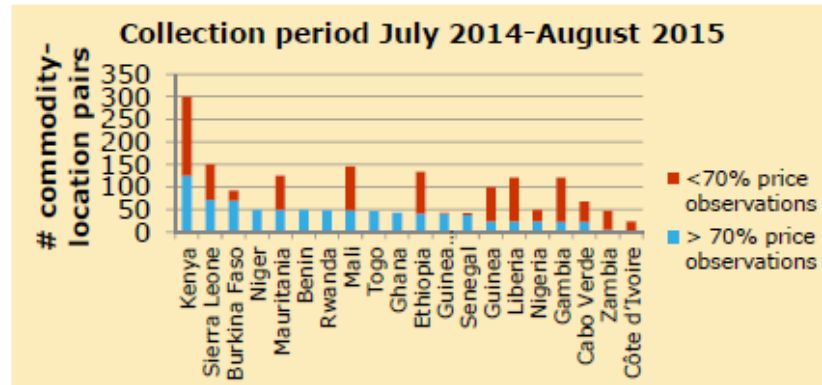


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**knoema**



## Completeness of project time series of food prices



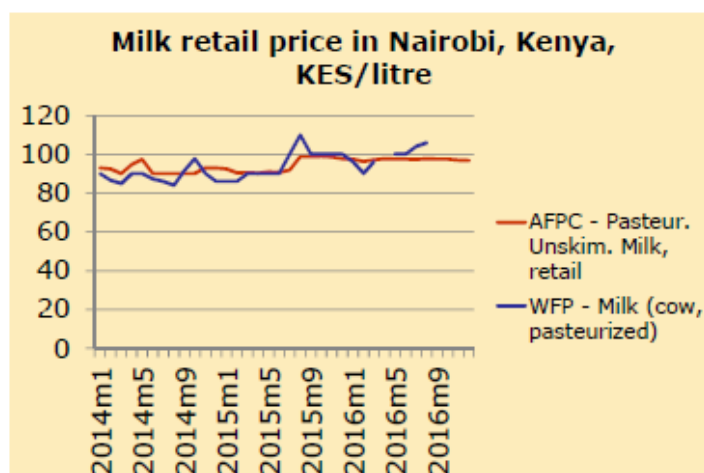
### Limitations identified:

- Building the network (make awareness, build confidence)
- Infrastructure challenges (electricity power, connectivity)
- Intermittent submissions (other jobs, often travelling)
- Political/social conflicts
- Payment issues

3



## How do prices compare with other sources? Example



Comparison with other sources difficult

- Different commodities, sorts, qualities
- Retail vs wholesale

Crowdsourcing, multiple points-same market, was tested

- Variability of prices between different outlet types and different areas/markets within a location can be high → difficult to capture

4



## Lessons learned and conclusions

- **Feasible method** for timely collection and dissemination of prices but
  - **Several challenges** were identified and had to be overcome
  - **Issues of quality and representativeness** (only 1-2 markets per country, mostly 1 collector)
- **Building the network** → difficult making awareness and building confidence
  - **Options:** Social media, friends/colleagues, non-profit org. etc).
  - **Find the right incentives/adjust**
- **Collection design:** clear definition of food items with images (e.g. ICP based catalogue) incl. quality, type of outlet, etc.; trial submissions, training doc.
- **Collection process:**
  - **Avoid human errors** by building features in the tool (automatic unit conversion, GPS location, multi-lingual support, promote use of app, flexibility of entry)
  - **Crowd moderation**
- **Verification and validation** of price observations:
  - **Building as much as possible automatic controls:** alerts of completeness, excessive fluctuation (30%) or flat prices; use control data
  - **Rating of participants**
- **Quality outcome:** make of the "wisdom of the crowd" → robust methodology
- **What do others do?** → **Cooperate** with other practitioners, local & international

5



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### JRC-Report in preparation



# Thank you!

7



## Stay in touch



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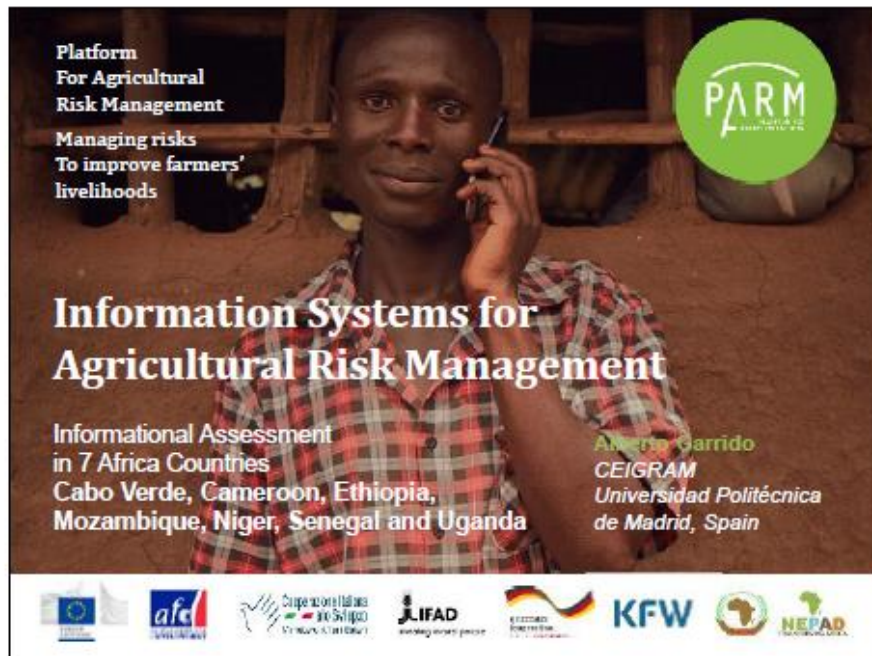
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## Information Systems for Agricultural Risk Management: assessment in 7 Africa Countries, PARM

Alberto Garrido, CEIGRAM



### Team Work

---

**Study conducted by:**

**CEIGRAM - UPM:** Alberto Garrido, José M. Sumpsi, Isabel Bardaji, Marina Martínez, M. Inés Mínguez, Carlos Hernández, Lucía Rodríguez, Ana María Tarquis, Rosa M. Benito, Esperanza Luque.

**VISAVET- UCM:** J.M. Sánchez-Vizcaíno, Joaquín Goyache, Marta Martínez, Ángel M. Ramos, José Luis Sierra, José María López, Eduardo Fernández, Beatriz Villa, Laura Rico, Almudena Morate, Raquel Vargas



## Content



1. Why info systems (IS) are crucial for agricultural risk management (ARM)?
2. What is the scope and method of the study by CEIGRAM+VISA VET for PARM?
3. Data sources and evidences
4. Results
5. Policy Conclusions



## 1. Why info systems are crucial for ARM?



### ARM tests are based on:

- Who uses it, who benefits from it
- How efficient they are in avoiding/mitigating impacts
- Reducing cognitive dissonance
- Preparedness for disaster/crisis
- Recovery after a disaster/crisis occurs
- Private sector innovation



## 1. Why info systems are crucial for ARM?



### ARM's potential rests on:

- The analysis of historical data and facts
- Capacity to relate processes
- Establish and discover causalities
- Capacity to model processes
- Capacity to gauge probabilities
- Capacity to evaluate costs of events



## 2. What is the scope of the study?



### 8 Thematic Blocks // 7 African countries

#### Blocks

Meteorological and climate information

Satellite image information & Communications

Prices of commodities and inputs, and timely access to information about markets, transportation and input availability

Production levels and yields, Plant health

Animal and human health

Policy

Socio-economic and sectorial info

Integrated systems of information

Cabo Verde,  
Cameroon,  
Ethiopia,  
Mozambique,  
Niger, Senegal  
and Uganda

### 3. Methodological approach



#### Benchmark of Information Systems

- The benchmark is the ideal ARM information system, a canonical system whose components, structure and logic are defined according to decades of experience, assessments and best practice.



### 3. Methodological approach



#### The components of *Bchmk-ARM-IS* are:

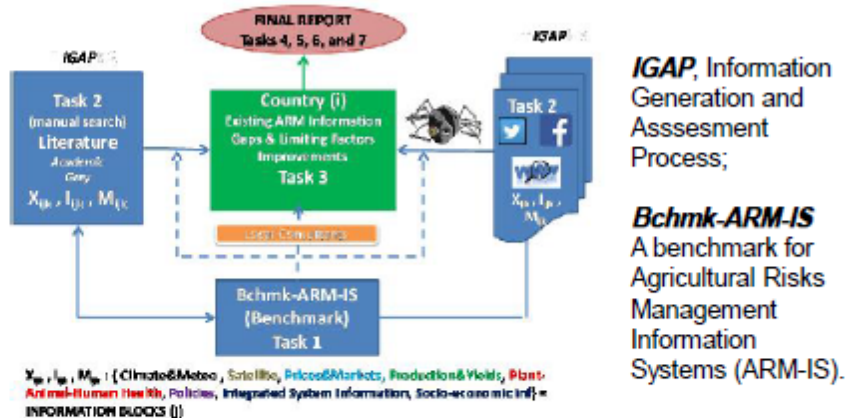
- |   |   |
|---|---|
| i. Primary data / variables                         | Examples  |
| ii. Images  | • X (daily precipitation) → I (Drought index) → M (Biomass in pastures)       |
| iii. Indicators                                     | • X (wind velocity and direction) → I (Vector mobility) → M (Disease warning) |
| iv. Services  |   |
| v. Integrated systems                               |   |
| vi. Institutional framework and capacity to monitor |   |
| vii. Technical support and human capacity           |   |

Components (i)-(vii) can be defined or expressed by Data (X), Indicators (I), Markers (M), Other elements (O).

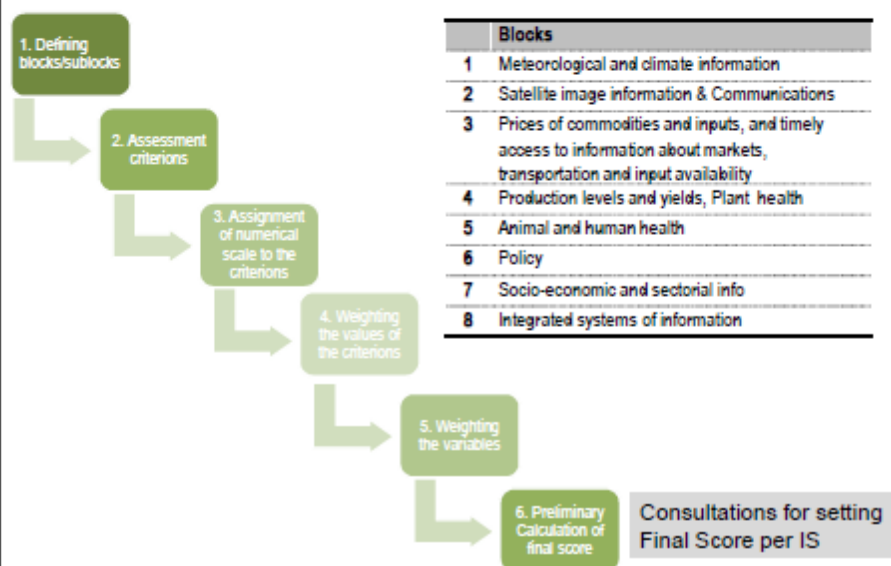
### 3. Methodological approach



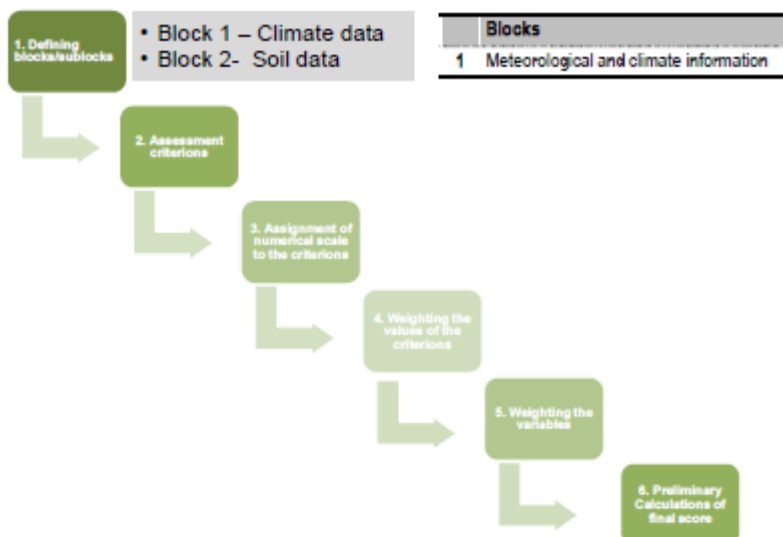
#### Methodological approach



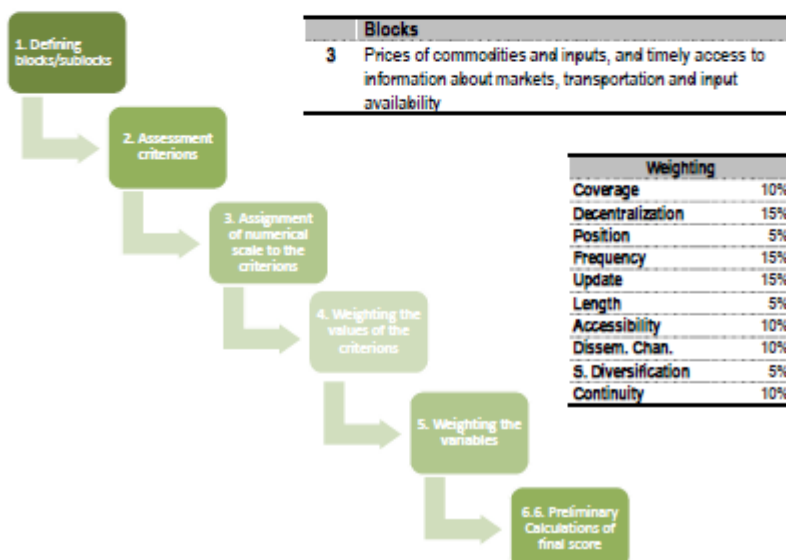
### 3. Methodological approach



### 3. Methodological approach



### 3. Methodological approach





### 3. Methodological approach



#### *Number of IS identified by thematic block in Ethiopia*

Thematic Block	National	Regional	International	Total
1 - Meteorological/ Soils information	4	1	5	10
2 - Remote Sensing	2	5	8	13
3 - Prices/markets	11	5	6	22
4 - Plants	5	2	6	13
5 - Animal	9	0	14	25
6 - Policies	7	0	9	16
7 - Socio-economic	1	2	1	4
<b>Total</b>	<b>39</b>	<b>15</b>	<b>49</b>	<b>103</b>

### 3. Methodological approach



#### *Scoring each Block for each country* *Qualitative assessments*

1. Complementarity across IS
2. Preponderance of national systems
3. Assessment of each IS
4. Overall value for ARM
5. Consultations with national experts and officers
6. Matrix of weaknesses and strengths for subblock



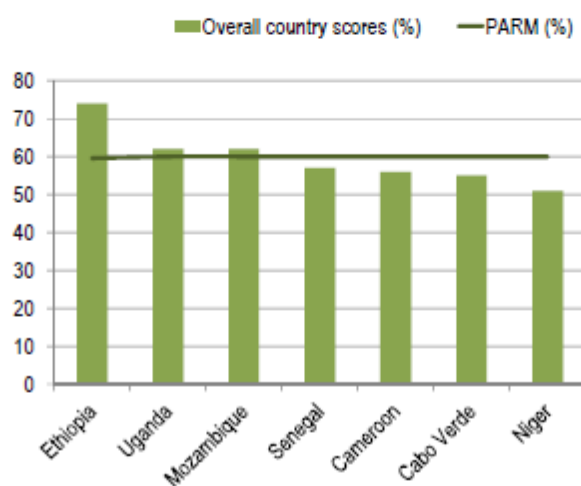
### 3. Methodological approach



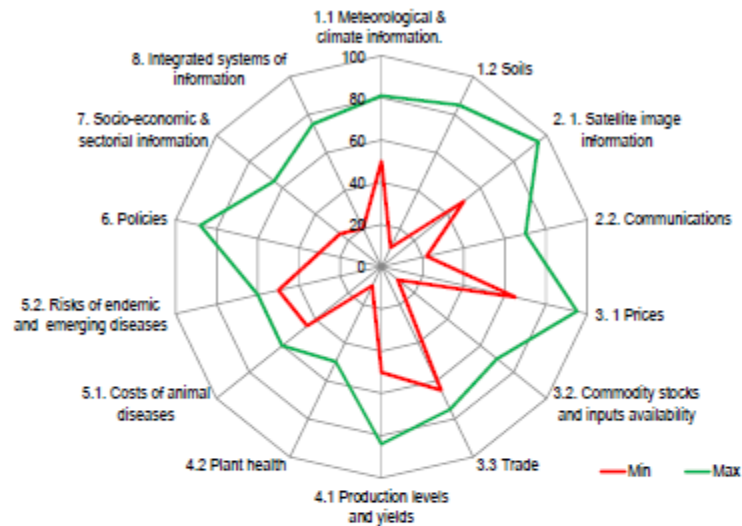
#### Global Scores for each country

Thematic Block	Weight
1.1 Meteorological & climate information.	13%
1.2 Soils	3%
2. 1. Satellite image information	5%
2.2. Communications	5%
3. 1 Prices	15%
3.2. Commodity stocks and inputs availability	5%
3.3 Trade	5%
4.1 Production levels and yields	12%
4.2 Plant health	5%
5.1. Costs of animal diseases	10%
5.2. Risks of endemic and emerging diseases	10%
6. Policies	5%
7. Socio-economic & sectorial information	2%
8. Integrated systems of information	5%
<b>Total Score by country</b>	<b>100%</b>

### 4. Results | Comprehensive results



## 4. Results | Comprehensive results



## 5. Policy Conclusions | Recommendations



### 1. Specialisations in core professional expertise and legal mandate of information systems

Fewer IS but deeper is better than more superficial and broader IS



## 5. Policy Conclusions | Recommendations



### 2. Increase focus on the length of time series and the continuity in reporting the different values

Add **technical notes** describing the most important methodological, quality check procedures and sampling aspects.



## 5. Policy Conclusions | Recommendations



### 3. Stimulate private-based initiatives on information systems and provide adequate regulative protection.



## 5. Policy Conclusions | Recommendations



### 4. Provide disaggregated data

Data should be disaggregated at the most basic level of analysis



## 5. Policy Conclusions | Recommendations



### 5. Accessibility.

Data should be presented in functional webpages, not in pdf formats, checked and consistent with other international organisations. Information should be enabled through local radio and TVs, newspapers and sms.

Local languages are **relevant**












## Contacts

**PARM Secretariat**

**International Fund  
for Agricultural Development (IFAD)**

 Via Paolo di Dono 44 - 00142 Rome (Italy)

 [parm@ifad.org](mailto:parm@ifad.org)

 [www.p4arm.org](http://www.p4arm.org)

 [@parminfo](https://twitter.com/parminfo)