Information Systems for Agricultural Risk Management

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

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

The Problem

Farmers don’t run their farms as a business:
- Average land ownership less than two acres
- Outdated production & storage technologies, poor seeds
- Low cashflow generation and profitability

High Risks in the Sector
- High individual risks
- Farmers are highly exposed to risks (drought, pest & disease, market, etc.)
- Many risks are catastrophic
- Poor Risk Management knowledge and expertise

Service Providers shy away from the sector:
- Low purchasing power of farmers
- High risk for insurers
- High operational costs to service the sector

Result: an underserved sector
## Reasons for Underserving the Sector

<table>
<thead>
<tr>
<th>Reason</th>
<th>Financial Institutions</th>
<th>Insurance Companies</th>
<th>Other Service Providers</th>
<th>Extension Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target group with limited purchasing power</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>High cost of identifying target group &amp; collecting farmer information</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>High marketing &amp; distribution costs</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Exposure to systematic risks</td>
<td>✓ ✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High risk of default / non-payment / fraud</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
</tr>
</tbody>
</table>

## 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
**FIRM – How does it work?**

- Service Delivery & Trade
  - Farmers info & Risk Profile
  - Infoservice & Risk Management: Farmer data & records
  - Farming & Trading data
  - Weather & Market data
  - Risk Profile
  - Risk Mitigation options

**FIRM step 1: Data Collection & Sharing**

- Infotrade collect information from farmers in Infotrade
- 18 years experience in Uganda
- Mapping and profiling of farmers, traders and service providers
- Infotrade is the core of FIRM
  - Infotrade Basic: 900,000 farmers
  - Infotrade Premium / Basic plus: 16,000 and currently growing 5,000 / month
  - 209 in production information advisors (PIAs)
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 contribute 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

---

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

**EXTENSION SERVICES, NGO & POLICY**

- Individual and aggregated risk insights
  - Support Risk Analysis
  - Indicate most effective risk mitigation solutions
  - Aggregated overview of risk issues

**BANKS, INSURERS, SERVICE PROVIDERS**

- Lower Barriers & Costs:
  - Reduce marketing costs with turnover of pre-screened farmers
  - Lowering the cost of collecting and analyzing data
  - Reduce transaction costs with Malti Card
  - Risk analysis on individual and systematic risks
  - Indication of need for risk mitigation products
**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 Masi Card

**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 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 Masi Card
   - Collect repayment via Masi Card
   - Receive transaction based credit information
   - Reduce cost on distribution
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 Moji Card
   - Distribute payouts via Moji Card
   - Reduce cost on distribution

4. Packaged Insurance
   - Package insurance with other products, like loans or inputs
   - Increase marketing opportunities

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 Moji Card
   - Reduce cost on distribution

4. Package with other Products
   - Package own product with other products & services
   - Increase marketing opportunities
**User Case: Extension Services & Policy**

**Extension**
1. Understand Risk Profile
   - Get insight in the risk profile of farmers
   - Identify training opportunities
   - Increase effectiveness of programs

**Policy**
1. Portfolio Overview
   - Get an overview of farmers, risk and trade on village, district, national level
   - Identify weak spots in the system

2. Policy & Support
   - Improve policies on village, district and national level
   - Improve resilience of farmers
   - Support public & private sector in service delivery to farmers

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**Business Model**

<table>
<thead>
<tr>
<th></th>
<th>Farmers</th>
<th>Banks &amp; Insurers</th>
<th>Service / Input Providers</th>
<th>Extension Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infotrade</strong></td>
<td>Farmers</td>
<td>Banks &amp; Insurers</td>
<td>Service / Input Providers</td>
<td>Extension Services</td>
</tr>
<tr>
<td><strong>Annual Subscription USD 10</strong></td>
<td>Pay as you go (pay per view) USD 1-5 per farmer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Buy Card for UGX 15,000</strong></td>
<td>Pay as you go 0.5% of transaction</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Behind the Scenes: PIA Model

- Based on Revenue Sharing Service Contract
- Self-Sustaining service continuity and Growth
- Free knowledge accumulation during the partnership

Potential for Bundling of Services
- Mobile Money Agents
- Input Dealers
- Commodity Aggregator/Buyers
- Storage Business
- Transport Business
- Tillage Business
- Value Addition Business
- Commercial Extension Provider

BUNDLING SERVICES

The Infotrade Maali Card Eco-System

INTERSWITCH Money Agent
Commodity Buyer/Off taker
Card provides the opportunity for people to:
- Issue
- Save
- Receive
- Send
- Spend money electronically

The Farmer/Trader
The Bank
POS
Sacco/Imps
The insurance firms
Money Agents model

SACCO Management  Private Commodity Buyers  Cooperatives Produce buyers

Individual members  Members in SACCOs  Professed Farmers (selling produce)

Farmer  Information generating  Information sharing

Coop Members  Farming produce  Maturity

Behind the Scenes II – Agri Risk Analyzer

- The Agri Risk Analyzer compiles a cashflow of the farmer
- This can be based on basic inputs like location, crops, land size, sales channels and household characteristics for more simple use
- It can also be based on a more enhanced profile of the farmer for advanced use (e.g. finance)
- A simulation of the cashflow is made, with scenarios based on what we know of:
  - Yield variability (insurance models)
  - Price volatility (market models)
  - Life & health events causing cashflow shocks (insurance models)
  - Pest & Diseases (forthcoming, i.e. Makerere University)
  - Other sources of cashflow variability (expert opinion possible)
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 vulnerable 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.)

FIRM Partners

Infotrade
FINCA
Pearl Bank
Jubilee
MacKenzie University
Ministry of Agriculture

5-7-2017
### FIRM Partners

- **Infotrade**
  - Lead partner
  - Infotrade Database
  - Farmer field network
  - Maazi Card
  - Training of end users

- **FINCA**
  - Delivery of Agri Risk Analyzer (ARA)
  - Technology
  - Leading R&D activities
  - Training of end users

- **PeatBank**
  - Recipient of farmer risk profiles
  - Product development & innovation
  - Provide loans
  - Provide other financial services

- **Jubilee**
  - Recipient of farmer risk profiles
  - Provide insurance

- **Masindi University**
  - Strategic partner in R&D of ARA
  - Operate field research
  - Training partner of extension networks

- **PARM**
  - Strategic partner in R&D of ARA
  - Operate field research
  - Training partner of extension networks

### Timeline & Milestones

- **H1 2017**
  - Further expansion into rural areas & expansion of PIA network
  - Maazi Card pilot
  - ARA adaptation for Uganda (including field research)
- **H2 2017**
  - Training of PIA network on risk profiling
  - Expansion of Maazi Card
  - Roll out payment terminals
  - ARA integration into Infotrade
  - Produce farmer risk profiles
- **2018**
  - Further expansion of farmer / PIA network
  - Further expansion of MaaziCard / POS terminals
  - Share integrated farmer risk profiles with service providers
- **2019 >>**
  - Further expansion & growth
  - Product design and delivery (c.w. service providers)
Results in numbers

- 34,000 Farmers accessed capacity building/extension services
- 170,000 Farmers subscribed to FARMIS
- 45,000 Farmers used risk mitigation advice
- 50,000 Farmers accessed loans for the first time
- 50,000 Farmers get offers from service/input providers
- 15,500 Farmers access insurance for the first time

Gain in better prices due to information: USD 3/1/farmer
Increase in production: USD 1.5/1/farmer
Net value of reduction in post-harvest losses: USD 2/1/farmer
Save on improved interest rates: USD 0.2/1/farmer
Save on better offers from input providers: USD 0.2/1/farmer
Save on improved insurance premiums: USD 1/1/farmer

Total increase in income of USD 3.5/1 for 170,000 farmers in five years

What do we need

Donors
- FIRM: Funding need of USD 760k
- Additional funding needed for development of public services (extension)

Business Partners
- Financial Institutions
- Insurers
- Input/Service providers

Field Partners
- NGOs
- Outgrower Schemes
- Cooperatives
- Other farmer networks

Public sector
- Extension network
- Creating awareness
- Support and enhancement

Knowledge Partners
- Pest & Disease knowledge (i.e., Makerere)
- Political Risk Knowledge / Models

Infrastructure Risk knowledge
- Post harvest losses
- Farmer livelihood expertise
Thank You

FIT Uganda
robert@fituganda.com
www.fituganda.com
www.infotradeuganda.com
+256 751 460354
+256 414 536 393

Agri Risk Analyzer
jaime.ter.linden@agririskanalyzer.com
www.agririskanalyzer.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
ICT4Ag @ CTA

ICT & ENTREPRENEURSHIP FOR INCLUSIVE AGRICULTURE SYSTEMS

PRECISION AGRICULTURE FOR SMALLHOLDER FARMING

Market-led, User-owned ICT4Ag-enabled Information Service (MUIIS)
**MUIIS Context - 1**

Market-Led (Value Chain Approach)

User-Owned (Demand-Driven)

*ETA Project*

**MUIIS Context - 2**

Anchored on Groups/Coops

Multi-tier Capacity Development

*ETA Project*
Ground Data from Farmers

Satellite Data for Farmers

Weather alert  Agronomic tips  Index-base Insurance
The Business Case

Revenue Streams
- Subscription through a mobile phone
- Farmers membership fee via FBOs
- Profiling
- Surveys
- FBOs & Coops with lease agreement on behalf of farmers
- Access to a "farmer help desk" by staff of Mercy Corps
- Financial services to farmers via aggregators, insurance companies
- Crop insurance licences to insurance companies

Distribution channels
- Mobile Platforms
  - MOBIS
  - e-Grainery
- Supported by
  - Agents Networks
  - Farmer Organisations
  - Private businesses
  - NGOs

Cost Structure
- Satellite data management
- Market information
- Value chains
- ICT and mobile network services
- Value chains and sales
- Training and capacity building
- Mobile profiling devices
- Project management

350,000 Smallholder Crop Farmers Reached by 2018

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
With Support from.....

Thank you
Join our communities for more stories, videos, etc.

https://dgroups.org/groups/web2fordev
https://dgroups.org/cta/ict4ag

www.cta.int
Follow us on Facebook and Twitter

CTA operates under the framework of the Cotonou Agreement and is funded by the EU
Presentation 1.3:
ICTs in Plantwise: Management of plant health risk, CABI
Dannie Romney, Program Manager, CABI

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**Plantwise**

- Networks of plant clinics run by trained plant doctors established (PDs)
- Knowledge bank (KB) of plant health information
- Strengthen 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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**ICTs in Plantwise: Management of plant health risk**

Compilation of slides by members of the Plantwise program team
D Romney, 31 Jan 2018, PARM

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**Knowledge for Life**

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Networks of plant clinic deliver advice / collect data

- Loss mitigated
- Farmer spots problem
- Farmer follows advice
- Sample brought to plant doctor (PD) at clinic
- PD - diagnoses problem / gives actionable advice using Knowledge bank (KB)
- Client data captured in KB

How plant clinic networks contribute to monitoring

- Client data captured in KB
- PDs diagnose/advise
- PDs networked with others - including experts
- Early warning of emerging pest outbreaks
ICTs in Plantwise

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

Providing knowledge
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

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
Offline Plantwise Factsheet Library

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

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
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

Monitoring
**Data collection app**

- 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

**Plantwise Online Management System**

- 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

Validation spreadsheet

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

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.
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
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:
  - Utumi TV in Kenya
  - ZNBC-Radio 2 in Zambia
  - Nkhata community radio in Malawi

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
www.twitter.com/CABI_Plantwise
www.facebook.com/Plantwise
www.youtube.com/Plantwise
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)
    - Development of a prototype Website, allowing partners inputs and data & information sharing
    - First Bulletin: 5th February 2016

Objective and Partners

- Exchange information, build consensus and reduce uncertainty in countries most vulnerable to food insecurity, to strengthen agricultural decision making
- Partners:
First Crop Monitor for Early Warning, Feb. 2016
Consensus Map highlighting the poor conditions in Southern Africa for Maize

1 new condition: Failure

3 more drivers:
- Pest & Disease
- Socio-Political
- Delayed Onset

CM4EW Pie Charts
- sectors proportional to countries average share of region production
- sub-sectors with colors according to the share of local crop conditions
- symbols to explain reasons for bad conditions
Achievements
Global Crop Monitoring

Coverage of about 94% of world agricultural area...
Objectives: Expand partnership on regional and national partners

For more information or questions please contact:
Inbal Becker-Reshef: ireshaf@geoglam.org
GEOGLAM Secretariat, Crop Monitor Lead

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

**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.
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.

Thank you!

Paolo Lucchino
paolo@premise.com
Platform, App, Services + Ecosystem Integration

**SERVICES**
- Program Design: Target Data, Target Outcomes, Contributor Network Model, Implementation Plan
- Form Design: Task Flow Creation, Target Object Definition, QC Verification
- Network Building: Contributor Acquisition, Education & Training, Localization, Event Support, Mgr Recruiting
- Analytics & Optimization: Data Analysis, Visualization, Predictive Analytics, Outcome Optimization

**APP**
- Contributor On-boarding: Private/Public Network Allocation, User Profile Creation, Identity Management
- Task Discovery: Task Availability, Task Reservation
- Task Flow Mgmt: Task Execution, Mgmt Training, Task Submission
- Feedback & Rewards: Submission Acceptance, Reputation, Earnings, Payments

**PLATFORM**
- Form Mgr: Form Library, Form Builder, Task Config, Data Validation Rules
- Data QC Mgr: Aros QC, QC Scoring & Grading, Manual Review Mgmt
- Data Governance Mgr: Policy, Objects, Data Dictionary, Version Management
- Network Mgr: Segmentation, Categorization
- Data Science Models: Statistical Analysis, Machine Learning, Predictive Algorithms, Recommendation Engines for operational improvements

**DATA**
- Contributor Mgr: Contributor Profiles, Contributor Preferences, Contributor Training
- QC Worker Mgr: QC Worker Profiles, QC Worker Performance, QC Worker Training
- Campaign Mgr: Task Distribution, Task Reporting, Task Investigation, Task Invoicing
- Campaign Perf Mgr: Pipeline Data Analysis, Data Confidence Scoring, Campaign Performance, Report Templates, Visualization, User Interface Design

**PEOPLE**

**PROGRAMS**

**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.

![Map of Vector Control Optimization](image)
Presentation 2.3:
ECOWAS-ECOAGRIS
Moussa Mama, Regional Officer, AGRHYMET, ECOWAS

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
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

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;
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.

Management

- Many national information mechanisms 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 support 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.
- A partnership with international NGOs (Save the children, Oxfam GB, Oxfam Intermoor, 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

- 205 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-Meteor, 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.

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
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.

Conclusion

At the end.

To trigger the Regional Food Security Reserve to better assist populations in food crises zones.
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
**African Risk Capacity**

**Disaster Management Response**

**Value for Member States**

ARC aims to provide cost-effective contingency funding to protect livelihoods and development gains.

ARC brings together:

- Early Warning: Africa RiskView
- Response: Contingency Planning
- Insurance: Index-based insurance and risk pooling

As a result, a dollar spent on drought response through ARC saves $4.40 in traditional humanitarian assistance costs.
B. Structure of the ARC

Current ARC Member States

Original Signatories (23 November 2012)
1. Burkina Faso
2. Burundi
3. Central African Republic
4. Chad
5. Republic of Congo
6. Djibouti
7. Gabon
8. Guinea
9. Liberia
10. Libya
11. Malawi
12. Mozambique
13. Niger
14. Rwanda
15. Saharan Arab Democratic Republic
16. Senegal
17. Togo
18. Zimbabwe

Additional Signatories (date signed)
20. Mauritania (29 January 2013)
21. Côte d’Ivoire (9 February 2013)
22. Comoros (15 February 2013)
23. Gabon (30 January 2014)
24. Madagascar (31 January 2014)
25. Nigeria (4 December 2014)
D. Drought Risk Model: 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
- Estimate impact on people
- Calculate response cost
- Define risk transfer

Quantifying risk:

1. Rainfall
2. Drought
3. Modelled impact
4. Response costs
5. Risk transferred to Arc

Vulnerability
D. ARC in Action

Pool 1: Payout Implementation

- Payout at end 2014 due to West Africa drought
- Funds in national accounts before UN Sahel appeal launched

23rd PAYOUT
$26.3 million payout
1.3 million people
600,000 livestock

Member since 2011TS
Member since 2017TS
Pool 1: Payout Implementation

- **Senegal ($16.5 Million)**
  - Targeted food distribution
  - Total beneficiaries: 337,416 people
  - Subsidised sale of cattle feed
  - Beneficiaries: 570,459 animals
  - End of season: Dec 10
  - Funds released from Ltd: Jan 27
  - Premium: $3.4 m

- **Mauritania ($6.3 Million)**
  - Targeted food distribution
  - Total beneficiaries: 250,000 people
  - In March 50,000 households identified and provided with distribution cards (average 5 people per household)
  - End of season: Nov 20
  - Funds released from Ltd: Jan 29
  - Premium: $1.6 m

- **Niger ($3.5 Million)**
  - Targeted food distribution
  - Total beneficiaries: 157,000 people
  - Conditional cash transfer and food distribution in drought-affected regions
  - End of season: Oct 31
  - Funds released from Ltd: Feb 15
  - Premium: $3.0 m

Monitoring & Evaluation on payout implementation ongoing

---

THANK YOU!

Website: www.africanriskcapacity.org
Twitter: @ARCapacity
Presentation 3.2:
The use of satellite imagery for Agricultural monitoring and insurances
Laurent Tits, VITO Representative
VITO remote sensing

- End-to-end know how
- instruments (cameras, sensors)
- platforms (satellites, airplanes, UAS)
- raw data
- information
- time series analysis
- end user client
- decisions
- pixel values, spectra, digital imagery
- land use change
- Data Storage & Distribution
remotesensing.vito.be

Monitoring agriculture with remote sensing

- Low/medium resolution images available on a daily basis, free of charge, covering the entire globe...
- Timely and objective information for vegetation monitoring
- @ VITO: many projects on agricultural monitoring, worldwide
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

Index insurance

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

Index insurance: Remote sensing indices tested

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

<table>
<thead>
<tr>
<th>RSSP</th>
<th>Type of product/approach</th>
<th>Remote sensing data used</th>
</tr>
</thead>
<tbody>
<tr>
<td>VITO</td>
<td>Vegetation indices (PAPAR) + Rainfall estimates</td>
<td>SPOT-VGT / Proba-V PAPAR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TAMSAT rainfall estimates</td>
</tr>
<tr>
<td>NewsNet (USGS)</td>
<td>Actual evapotranspiration</td>
<td>MODIS based actual ET</td>
</tr>
<tr>
<td>ERS</td>
<td>Relative evapotranspiration</td>
<td>MODIS based relative ET</td>
</tr>
<tr>
<td>TTC</td>
<td>Vegetation indices (NDVI)</td>
<td>SPOT-VGT / Proba-V NDVI</td>
</tr>
<tr>
<td>HMI</td>
<td>Rainfall Estimates</td>
<td>NOAA based RFE2 JRC</td>
</tr>
<tr>
<td>Geoville</td>
<td>Radar-based estimation of soil moisture</td>
<td>ERS / METOP ASCAT</td>
</tr>
<tr>
<td></td>
<td>3S based on Soil Water Index</td>
<td></td>
</tr>
<tr>
<td>Sermapp</td>
<td>Radar crop maps and 3S indicators</td>
<td>CosmoSkyMed data</td>
</tr>
</tbody>
</table>
Index insurance: VITO insurance product

Insurance product based on RS derived yield estimates
- Input:
  - Remote Sensing (RS) data:
    - 10-day SPOT VGT 1km IAPAR
    - 10-day TRMM daily 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" (UAIs, Unit Areas of Insurance)

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 gap between actual yields and potential yields is significant and highly variable: the accurate definition of the Unit Areas of Insurance (UAIs) 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.

remote sensing.vito.be
Thank you!

Tits Laurent, Isabelle Piccard, Sven Williams, Emily Coleman, Francesco Repoli
Presentation 3.3:
The role of social protection in managing agricultural risk
Natalia WinderRossi, Senior Social Protection Officer, FAO

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
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.)

Social Protection Pillars

- Social Assistance: Alleviating chronic poverty
  - Examples: cash transfers, public works, in-kind assistance

- Social Security: Insuring the uninsured against:
  - Adverse personal circumstances
  - Life-cycle hazards
  - Livelihood risks
  - Examples: Mutuelle de Santé, Crop Insurance

- Labor Market P.: Facilitates employment and promote livelihoods
  - Ensure basic standards at work and extend rights
  - Example: maternity leave, minimum wage, labor rights
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) continue to experience risks and vulnerability – climate, weather shocks, price volatility, health, and other.

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 to Zambia looking at weather related shocks.
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 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 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
Many thanks

For more information on IACs work:
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
Rogerio Bonifacio, Geospatial Analysis Team Leader, WFP
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.

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.
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:
Rogerio Bonifacio
rogerio.bonifacio@wfp.org
+39 06 6313 3917
Presentation 4.2:
Integrated Food Security Risk Analysis, FEWS NET
Bruce Isaacson, FEWS NET Chief of Party, USAID

Outline

- Introduction to FEWS NET
- Analytical Approach
Introduction to FEWS NET

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.
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

FEWS NET Country Coverage

FEWS NET Country Coverage
(As of February 2016)
Our network

Implementing Team

USG Science Partners

Private Sector

Partners

- National governments
- Regional technical organizations (CILSS, SADC, COMESA, IGAD)
- WFP, FAO, UNICEF, UNHCR, other international agencies

- Non-governmental organizations
- Price/Market Information Systems
- Meteorological centers
- IPC working groups

FEWS NET Analytical Approach
FEWS NET Analytical Approach

2. Monitor key risk factors

- Effective decision support
- Livelihoods-based analysis
- Efficient Monitoring
- Comparable classification
- Scenario Development

FEWS NET Analytical Approach

3. Use scenarios to estimate projected food security

- Knowledge base
- Efficient Monitoring
- Livelihoods-based analysis
- Comparable classification
- Scenario Development

<table>
<thead>
<tr>
<th>STEP 1: Set scenario parameters</th>
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</thead>
<tbody>
<tr>
<td>STEP 2: Describe and classify current food security</td>
</tr>
<tr>
<td>STEP 3: Develop key assumptions</td>
</tr>
<tr>
<td>STEP 4: Describe impacts on HH income sources</td>
</tr>
<tr>
<td>STEP 5: Describe impacts on HH food sources</td>
</tr>
<tr>
<td>STEP 6: Describe and classify projected HH food security</td>
</tr>
<tr>
<td>STEP 7: Describe and classify projected area food security</td>
</tr>
<tr>
<td>STEP 8: Identify events that could change the scenario</td>
</tr>
</tbody>
</table>
FEWS NET Analytical Approach

4. Use a common language for describing food insecurity

Comprehensive classification
Livelihood-based analysis
Efficient monitoring
Scenario development
Effective decision support

West Africa Food Security Outcomes, May 2015

Source: FEWS NET

FEWS NET Analytical Approach

5. Communicate analysis to decision-makers

Effective decision support
Livelihood-based analysis
Comparative classification
Efficient monitoring
Scenario development

Source: FEWS NET
Questions?

Bruce Isaacson  
Chief of Party  
FEWS NET  

bisaacson@fews.net
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  

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)

[Webpage image]

http://empres-i.fao.org

Restricted website (English)

CONFIDENTIAL DATA

[Webpage image]

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”)

[Mobile app images]
EMA-i and EMPRES-i

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 up and can be easily access at the user convenience
Platform for Agricultural Risk Management | Information Systems for Agricultural Risk Management Workshop

EMA-i – data collection:

Species Details

Animal Family
Mammal
Species
Cattle

Animal Type
Domestic

Production System
Smallholder: Dairy

At Risk
Cases: 250
Deaths: 6
Destroyed: 10
Slaughtered: 1
Vaccinated:

Diagnosis Status
Suspected

Disease
Rabies

Clinical Sign
Lesion

Dermatitis
Carate

Interdigital blisters
Carate

Interdigital vesicles

Surveillance Type
No selection

Source of Infection
No selection

Report Date (dd/mm/yyyy)
25/05/2016

Owner Date (dd/mm/yyyy)
25/05/2016

EMA-i – data collection:

Disease Tested
Rabies

Laboratory Tests
Add a Test

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

Treatments

Control Measures

Burial

Control of wildlife reserves

EMA-i Tanzania - New...
EMA-i – data reporting:

- Data are sent with internet connection

EMA-i: “Event Near Me”

- To visualize/access the reported outbreaks’ in/from a map
EMA-i: “Report Analysis”

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

1) Phase 1: First implementation (January 2013 – July 2014)
   a. Preparation and customization: January 2013 - July 2013
   b. Implementation – 10/112 districts (15 users)
   c. 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

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

Geographical coverage: 10/112 districts: Nakasongola, Mbale, Rakai, Sironko, Busia, Lyantonde, Isingiro, Masaka, Mukono, Mityana, Kibale
EMA-i users: CVO, NADDEC (n=5), District Veterinary Officers (n=10)
Customization - animal diseases collected: 14 diseases

EMA-i interface in EMPRES-i

Accepted/Validated events are immediately made available in Event Mobile Application (EMA-i) for consultation in the field

At each step e-mail are automatically generated to inform the originator of the reported disease event and the individual responsible for the next action on the status of the specific event

Disease Event validation process
MAAIF/NADDEC

Disease Event acceptance process
MAAIF/NADDEC

Disease Event data transmission from the field
DVOL

EMA-i app/android

Immediate notification e-mail
All EMA-i users
Phase 1: Results

Title: Event Mobile Application (EMA-i): A novel tool for rapid disease reporting and information sharing
Authors: F. Larhous, F. N. Natema, T. Berenger, A. Colonna, S. Ramaswami, S. Chalker, J. Larhous (Phase)

**Introduction**

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

**Background Introduction**

Early detection and timely reporting of animal diseases are a challenge in developing countries, where poor infrastructure, human resources, and capacity for animal disease surveillance and reporting often leads to the absence of early detection. The EMA-i application (EMA-i) is an early detection and surveillance reporting tool developed in Uganda to support veterinary services in reporting the early occurrence of animal diseases.

**Materials and Methods**

EMA-i was implemented in the national animal health surveillance network in the collecting reporting information from the field to the decision makers and the veterinary services.

**Results and Conclusion**

The Ministry of Animal and Fisheries Development (MAFFD) has implemented several tools such as the Agri-Info platform, the Animal Disease Surveillance (ADS) platform, and the EMA-i application to support the early detection of animal diseases. From July 2013 to December 2013, 126 livestock reports were submitted to NADDEC compared to 45 in 2012 and 56 in 2011. EMA-i is currently used in Uganda to support veterinary services in reporting early occurrence of animal diseases in a timely manner.

**EMA-i: Phase 2 (July 2014 – December 2015)**

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

**EMA-i users:** CVO, NADDEC (n=5), District Veterinary Officers 1 (n=10), DVO 2 (n=15–18), Guest (n=6)

- **Periodical report list (Decision makers):** 11 persons

**EMA-i Interface in EMPRES-i**

- Immediate detection by mail
- Periodical report

**EMA-i app/android**

- Accepted/verified
- Events
- Application start
- Discussed/verified
- Submission/decisions
- Event
- DVO1

**Discussed/verified/transmission/decisions/field**

- NADDEC
- MAK/MAA/MAF
- DVO1
- DVO2

**Discussed/verified/transmission/decisions/field**

- NADDEC
- MAK/MAA/MAF
- DVO1
- DVO2
**EMA-i: Phase 3: Expansion (December 2015 – onward)**

**Geographical coverage:** 17/112 districts: Nakasongola, Mbane, Rakai, Sironko, Busia, Lyantonde, Isingiro, Masaka, Mukono, Kibale + 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)

---

**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!**

---

*Graph showing active EMA-i users in Uganda from 2013 to 2016.*
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
Thank you!

EMA-i contacts:
Julie Pietro (FAO - OLEWS): julie.pietro@fao.org
Martina Escouer (FAO - GLEWS): martina.escouer@fao.org
Alessandro Colonna (FAO - GLEWS/CIO): alessandro.colonna@fao.org
Sabina Ramazzotto (FAO - GLEWS/CIO): sabina.ramazzotto@fao.org
Farouc Larkou (FAO – FCC EMPRES): farouc.larkou@fao.org

Links:
empres-idfbo.org
http://empres-idfbo.org/empres-nz
http://empres-ifao.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
Presentation 5.1: 
Agricultural Market Information System (AMIS) 
Abdolreza Abbassian, Senior Economist, FAO
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

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
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: 
  - Wheat
  - Maize
  - Rice
- Focus: production, utilization, stocks, trade
- Participants: G20 Members + Spain and 7 invited countries
- AMIS Secretariat: eleven international organizations and entities:

Global coverage
AMIS participants account for the bulk of world production

AMIS setup

AMIS Secretariat
FAD, GEGLAM, IFA, IFPRI, IPCC, OIE, OICD, UNCTAD,
UN-HALO, WFP, World Bank Group, WTO

AMIS Participants
G20: Argentina, Australia, Brazil, Canada, China,
European Union, France, Germany, India,
Indonesia, Italy, Japan, Korea, Mexico, Russian
Federation, Saudi Arabia, Spain (permanent guest
member of G20), South Africa, Turkey, United
Kingdom or the United States.
Non-G20: Egypt, Kazakhstan, Nigeria, Philippines,
Thailand, Ukraine and Viet Nam.

Secretary
Steering Committee of the AMIS Secretariat
One representative from each member organization

Information Group
Market and policy information
Technical representatives

Rapid Response Forum
Dialogue and policy coordination
Component of senior officials
**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.

---

**What has been achieved so far?**
Some numbers...

- 5 Sessions of the AMIS Rapid Response Form
- 7 Countries hosted in the AMIS Exchange Programme
- 10 Editions of the AMIS Market Monitor
- 15 Country visits
- Conferences, seminars and training workshops

And in terms of the AMIS objectives?

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

UPDATED AND RELEASED MONTHLY

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
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)

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)

Background

- Sokopepe is a social enterprise set up by an award-winning NGO, ALIN, in 2014
- Small scale farmers in Kenya do not keep records
- FARMIS aids small scale farmers to keep digital records generating data for decision making at farm, county and national level
How FARMIS works

Proof of concept stage

- STTA:
  - Customisation 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 3,400 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
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
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
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

1 Software in 3 solutions

Automatic image recognition of plant diseases & pests

Smartphone Application

Software Interface

Geostatistics
Our App Plantix

Start | Picture | Selection | Treatment

Identify and treat plant damages in a quick & simple manner

Adaptation for Farmers’ Benefit

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

Prof. Patrick Baudisch, Head of Human Computer Interaction Helmholtz-Zentrum für Infektionsforschung
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
Crowdsourcing Data

Pictures → GPS → Geodata

Geodata are attached to every single picture

Real Time Geodata

- Spatial Distribution
- Correlations
- Early Warning
- Predictions
Agricultural Risk Management

- Weather & Disease alerts
- Farmer Information
- Early Warning Systems
- Research & Governance Institutions
- Ground truth data
- Micro Insurance Companies

**peat.ai**
Progressive Environmental & Agricultural Technologies

Download Plantix & Test us now

find us at peat.ai & plantix.net
contact@peat.ai
Playstore: Plantix
Technology Learning Curve

Now over 100 diseases!
Technology Learning Curve

Now over 100 diseases!
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 Stray in Anlehnung an MarcAndreessen @big thinking in PEATs office)
AI & BIG DATA

B2B Solutions
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.“
**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

**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
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

Conclusions & recommendations

Enabling environment
Stay in touch

EU Science Hub: ec.europa.eu/jrc
Twitter: @EU_ScienceHub
Facebook: EU Science Hub - Joint Research Centre
LinkedIn: Joint Research Centre
YouTube: EU Science Hub

The Survey and Interviews

<table>
<thead>
<tr>
<th>Nr</th>
<th>Name</th>
<th>Sector</th>
<th>Country</th>
<th>Data collection includes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Novus Agro</td>
<td>Private industry</td>
<td>Nigeria</td>
<td>Smartphone App, SMS</td>
</tr>
<tr>
<td>2</td>
<td>ACE</td>
<td>Private Industry</td>
<td>Malawi</td>
<td>Smartphone App, SMS</td>
</tr>
<tr>
<td>3</td>
<td>Observatoire du Riz</td>
<td>National Government</td>
<td>Madagascar</td>
<td>SMS</td>
</tr>
<tr>
<td>4</td>
<td>SIM CPC</td>
<td>NGO</td>
<td>Togo</td>
<td>SMS</td>
</tr>
<tr>
<td>5</td>
<td>SIMA</td>
<td>National Government</td>
<td>Niger</td>
<td>SMS</td>
</tr>
<tr>
<td>6</td>
<td>Rongéad</td>
<td>NGO</td>
<td>Cote d’Ivoire</td>
<td>SMS, other</td>
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<tr>
<td>7</td>
<td>Farmerline</td>
<td>Private industry</td>
<td>Ghana</td>
<td>SMS</td>
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<tr>
<td>8</td>
<td>Sonagess</td>
<td>National Government</td>
<td>Burkina Faso</td>
<td>Smart phone App, SMS</td>
</tr>
<tr>
<td>9</td>
<td>Esoko</td>
<td>Private industry</td>
<td>Ghana</td>
<td>Smart phone App, SMS</td>
</tr>
</tbody>
</table>
The European Commission’s science and knowledge service

Joint Research Centre

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

✓ **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**
Completeness of project time series of food prices

Collection period July 2014-August 2015

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

How do prices compare with other sources? Example

Milk retail price in Nairobi, Kenya, KES/litre

Comparison with other sources difficult
- Different commodities, sorts, qualities
- Retail vs wholesale

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

The European Commission’s science and knowledge service

Joint Research Centre

JRC-Report in preparation
Thank you!

Stay in touch

EU Science Hub: ec.europa.eu/jrc
Twitter: @EU_ScienceHub
Facebook: EU Science Hub - Joint Research Centre
LinkedIn: Joint Research Centre
YouTube: EU Science Hub
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 Martinez, 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+VISAVENT 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

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meteorological and climate information</td>
<td>Cabo Verde, Cameroon, Ethiopia, Mozambique, Niger, Senegal and Uganda</td>
</tr>
<tr>
<td>Satellite image information &amp; Communications</td>
<td></td>
</tr>
<tr>
<td>Prices of commodities and inputs, and timely access to information about markets, transportation and input availability</td>
<td></td>
</tr>
<tr>
<td>Production levels and yields, Plant health</td>
<td></td>
</tr>
<tr>
<td>Animal and human health</td>
<td></td>
</tr>
<tr>
<td>Policy</td>
<td></td>
</tr>
<tr>
<td>Socio-economic and sectorial info</td>
<td></td>
</tr>
<tr>
<td>Integrated systems of information</td>
<td></td>
</tr>
</tbody>
</table>
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
- ii. Images
- iii. Indicators
- 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).

Examples

- X (daily precipitation) → I (Drought index) → M (Biomass in pastures)
- X (wind velocity and direction) → I (Vector mobility) → M (Disease warning)
3. Methodological approach

**Methodological approach**

- **Task 1 (Manual search)**: Literature analysis
- **Task 2**: IGAP for Information and Assessment Process
- **Task 3**: Benchmarking ARM-IS (Benchmark)

**Blocks**

1. **Meteorological and climate information**
2. **Satellite image information & Communications**
3. **Prices of commodities and inputs, and timely access to information about markets, transportation and input availability**
4. **Production levels and yields, Plant health**
5. **Animal and human health**
6. **Policy**
7. **Socio-economic and sectoral info**
8. **Integrated systems of information**

**Consultations for setting Final Score per IS**
3. Methodological approach

Block 1 - Climate data
Block 2 - Soil data

1. Defining indicators
2. Assessment criteria
3. Assignment of numerical values to the criteria
4. Weighting the variables
5. Preliminary calculations of final score

Blocks

1. Meteorological and climate information
2. Agricultural and soil information

3. Farms of commodities and inputs, and timely access to information about markets, transportation and input availability

<table>
<thead>
<tr>
<th>Weighting</th>
<th>%</th>
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<tbody>
<tr>
<td>Coverage</td>
<td>10%</td>
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<tr>
<td>Decentralization</td>
<td>15%</td>
</tr>
<tr>
<td>Position</td>
<td>5%</td>
</tr>
<tr>
<td>Frequency</td>
<td>15%</td>
</tr>
<tr>
<td>Update</td>
<td>15%</td>
</tr>
<tr>
<td>Length</td>
<td>5%</td>
</tr>
<tr>
<td>Accessibility</td>
<td>10%</td>
</tr>
<tr>
<td>Disse. Chan.</td>
<td>10%</td>
</tr>
<tr>
<td>Diversification</td>
<td>5%</td>
</tr>
<tr>
<td>Continuity</td>
<td>10%</td>
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</tbody>
</table>
3. Methodological approach

Number of IS identified by thematic block in Ethiopia

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

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**

<table>
<thead>
<tr>
<th>Thematic Block</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Meteorological &amp; climate information.</td>
<td>13%</td>
</tr>
<tr>
<td>1.2 Soils</td>
<td>3%</td>
</tr>
<tr>
<td>2. Satellite image information</td>
<td>5%</td>
</tr>
<tr>
<td>2.2 Communications</td>
<td>5%</td>
</tr>
<tr>
<td>3.1 Prices</td>
<td>15%</td>
</tr>
<tr>
<td>3.2 Commodity stocks and inputs availability</td>
<td>5%</td>
</tr>
<tr>
<td>3.3 Trade</td>
<td>5%</td>
</tr>
<tr>
<td>4.1 Production levels and yields</td>
<td>12%</td>
</tr>
<tr>
<td>4.2 Plant health</td>
<td>5%</td>
</tr>
<tr>
<td>5.1 Costs of animal diseases</td>
<td>10%</td>
</tr>
<tr>
<td>5.2 Risks of endemic and emerging diseases</td>
<td>10%</td>
</tr>
<tr>
<td>6. Policies</td>
<td>5%</td>
</tr>
<tr>
<td>7. Socio-economic &amp; sectorial information</td>
<td>2%</td>
</tr>
<tr>
<td>8. Integrated systems of information</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total Score by country</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

4. Results | Comprehensive results

![Graph showing overall country scores and PARM (%)](chart.png)
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.

3. Stimulate private-based initiatives on information systems and provide adequate regulatory protection.
4. Provide disaggregated data
Data should be disaggregated at the most basic level of analysis.

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.