Innovative Projects in Agricultural Sector in Kenya

PRESENTATION

Boniface Akuku
Director ICT, KALRO
Chair- CODATA ATG - France
Climate Information Prize Winner, 2016
Africa CIO Award Winner, 2019
The Identified Risks in the Agricultural Sector in Kenya

**Production Risks**
- climate/weather shocks
  - Drought
  - Floods
  - Frost
- pest and disease outbreaks

**Market Risks**
- Crop/livestock price volatility
- Input price volatility
- Exchange rate volatility
- Interest rate volatility
- counterparty/default

**Enabling Environment Risks**
- policy/regulatory shifts
- Political instability
- Conflict and insecurity
- Crop theft and cattle rustling

**Natural Pandemics**
- COVID-19
  - Impact to livelihood
  - Impact to production
  - Impact to GDP
  - Shortage of supplies
  - High food prices
  - Impact to related industries
The Risk Mitigation Framework for the Kenyan Agricultural Sector
Strategies: The BIG DATA Platform project in Agriculture

- Established the Big Data Platform for the Kenyan Agricultural Sector

- Data Ingestion
- Data Analytics + Deep Learning
- Development & Dissemination of Data products & services
- Provision of data-driven evidence for decision making
- Crop/Livestock Weather Modelling (Bio-Informatics, Artificial Intelligence + Machine Learning)
- Provision of geo-referenced & context specific Advisories
- Production Suitability Assessment & Agro-Ecological zone Mapping
BIG DATA PLATFORM AS A SOLUTION

Stakeholders:
- SMS, Bulletins, Interactive Voice Response (IVR)
- WWW, Radios, TVS

Data from Crowd Sourcing

Agricultural Datasets

Geospatial Datasets

Remote Sensing Data e.g. NDVI

Geospatial Datasets

Climatic/Weather Datasets

Streaming/Real-time Data Sources

Climate data

Field station agricultural data

Weather data

Market data

Other Weather data
- Triangulations

Farming Practices information

Existing/known Data & New datasets

Big Data Storage

Advisories database (Agro, Market Trends, patterns, R/Shiny etc.)

Policy maker

Agricultural Researchers

Field Extension Officers

Stakeholders

Farmers/Pastoralists

Climate/Weather Crop Modelling,
- Data Mining
- Machine Learning
- Analytics
Technology As an approach to Risk Management in Agriculture

- Innovations: Disruptive Technologies
- Artificial Intelligence + Big Data
- Digitization
- Data products and service (Content Development)
- Capacity Building
- Scale
STRATEGY: Development of Use Cases
Establishment of Farmer Database: Farmer e-Infrastructure

- Judy Mambone
- Vihiga county
- Hamisi-Sub-county
- Banja ward
- Location
- Sub-Location
- Village

Geo-location for registered farmers - to support context specific + personally relevant advisories
DIGITIZATION OF AGRICULTURAL CONTENT IN KENYA: Example

Knowledge Sharing and Collaborative Learning
INNOVATIONS: EXAMPLES

Kenya Agricultural Observatory Platform (KAOP)

- 6,756 Virtual Met Stations in Kenya
- Every 9 X 9 Km Radius across Kenya
- 7 billion data points updated every 6 hours

Development of Mobile Apps

Social innovation

Image of KAOP platform and mobile app features.
Disruptions: Optimize on Data in Risk Management: The ABCDs of Agriculture

Steps toward Agricultural Data Value Realization in Managing Risks

Data for Development

Data Digitization

Data Value Proposition

Data for Innovations
Apply Agricultural Intelligence in Risk Management: Put pressure on organizations to manage agricultural data effectively

• Employ High Performance Computing to enhance Data processing speed
• Create Agility with agricultural data +Technology
• Create innovation from agricultural data
• Derive Insight from Data
• Use Data for Evidence and decision making
Data Democratization:
Demystify Data Sharing Fears and Exploit its Potential

- Public Sector
  - IARCs
  - NGOs, FBOs, CBOs

- Private Sector
  - IARCS
  - NGOs, FBOs, CBOs

- Development Partners
  - IARCs
  - NGOs, FBOs, CBOs

It is all about strategic partnerships.

No one can successfully do it alone.
Thank you

ARTIFICIAL INTELLIGENCE IS THE NEXT GENERATION OF SERVICES