



United Nations
Framework Convention on
Climate Change

NAPEXPO
CHILE 2023



“Harnessing Digitization of Climate Information Services for Sustainable Development in Africa’s Food security”

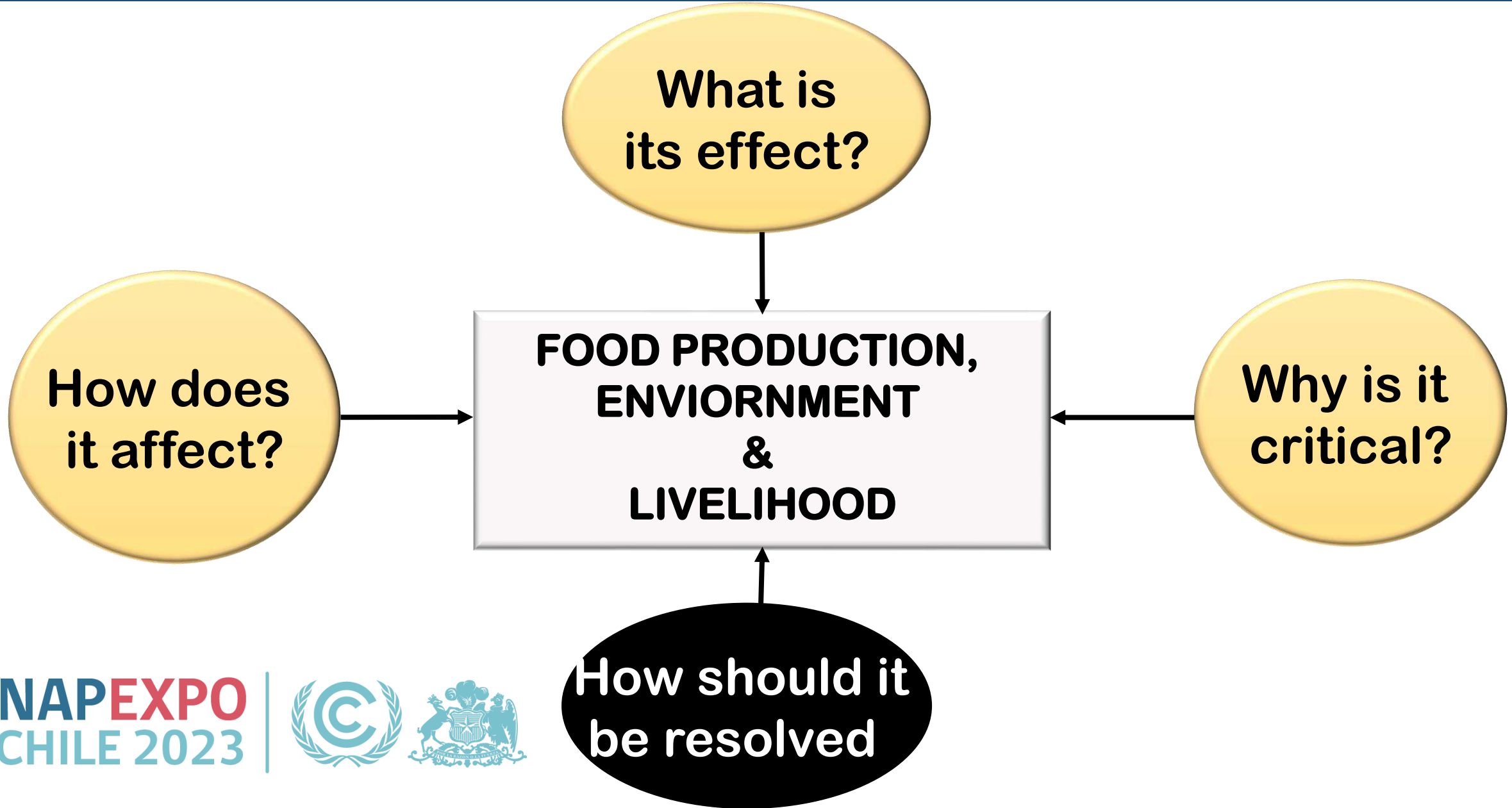
Boniface Akuku (PhD)

Climate Information Prize Winner, 2016

Africa TECH CIO Excellence Award , 2019

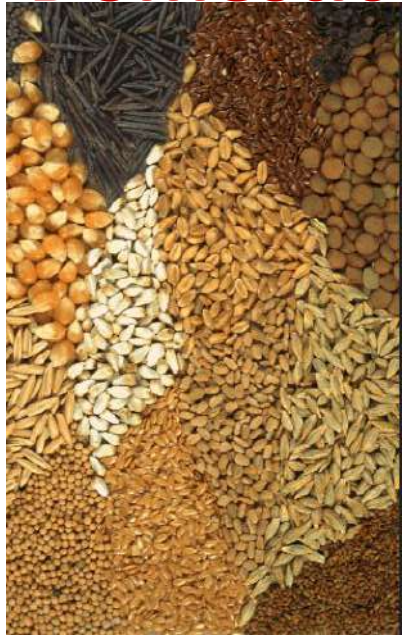


CLIMATE CHANGE/INSECURITY



The agricultural Potential: NOT realised due to Climate Insecurity

Domestic Produce



Cereal: 4,715

(Maize, beans, rice, wheat, cow peas, sorghum)



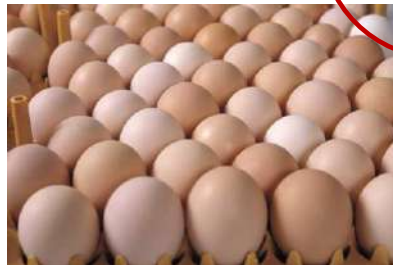
Roots and tubers: 9,477



Sugarcane: 5,900



Milk, 4,967



Egg: 96

Export Produce



Vegetables: 3,815



Tea: 378



Fruits: 3,292



Flowers: 480



Meat: 411

Source: kenya.opendataforafrica.org

Unit: Thousand MT

Climate Related Socioeconomic challenges



Past Response of African Governments to the challenges

Emphasis:

**Ex-post crisis response
through humanitarian aid**

Table 2: Droughts in Kenya in the last Decade

Major drought events	GoK and International Humanitarian Aid Received (US\$)*	Number People Affected**
2011	427.4m	3.75m
2009	423m	3.79m
2006	197m	2.97m
2003/2004	219.1m	2.23m
1998-2001	287.5m	2.36m

*UNOCHA financial tracking service and GoK figures

** Kenya Food Security Steering Group (GoK)

Missed opportunity:

**Investments in Ex-
Ante climate risk**

Mitigation

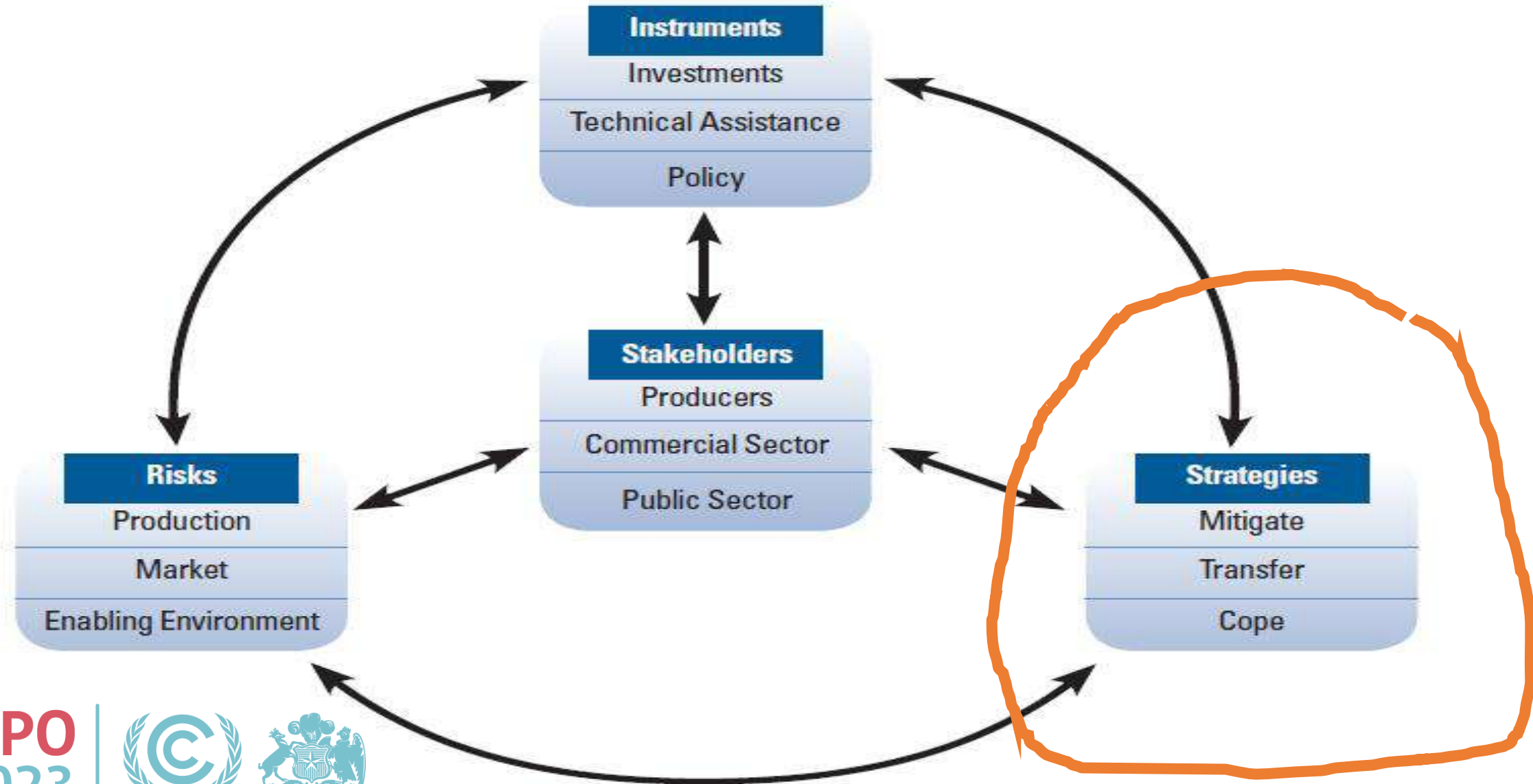
Management:

Proactive approaches:

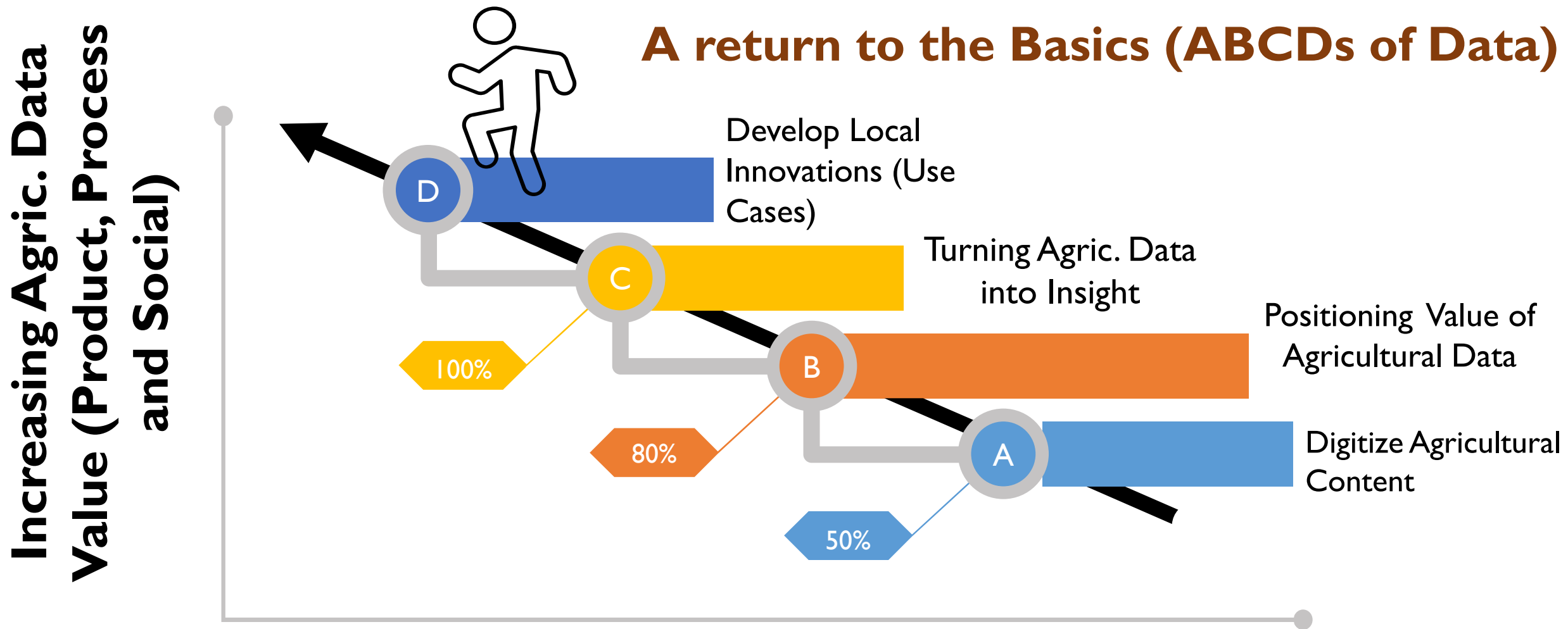
Digital interventions

**A shift is required from crisis response to Proactive
Response**

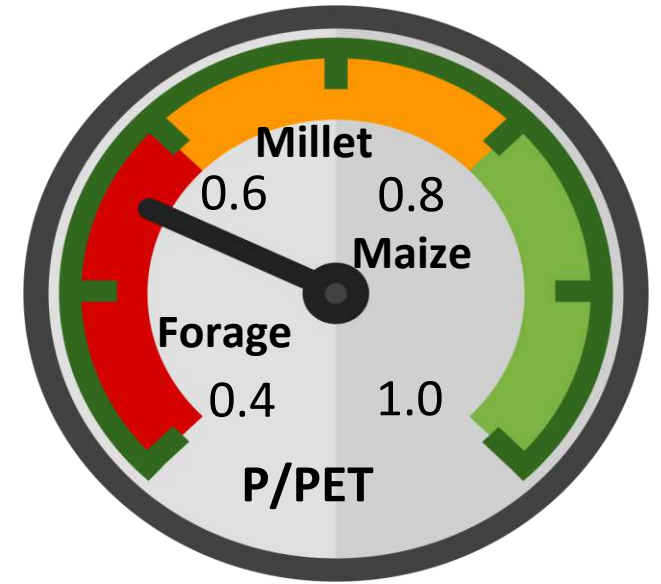
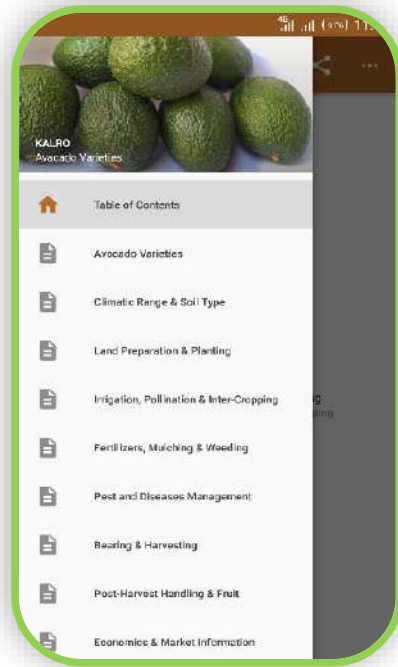
Therefore, a framework for building climate resilience is required



Strategy 1: Leverage on the 4th Industrial Revolution: Data spaces for local innovation



Strategy 2: Development of Use Cases at Scale + Impact

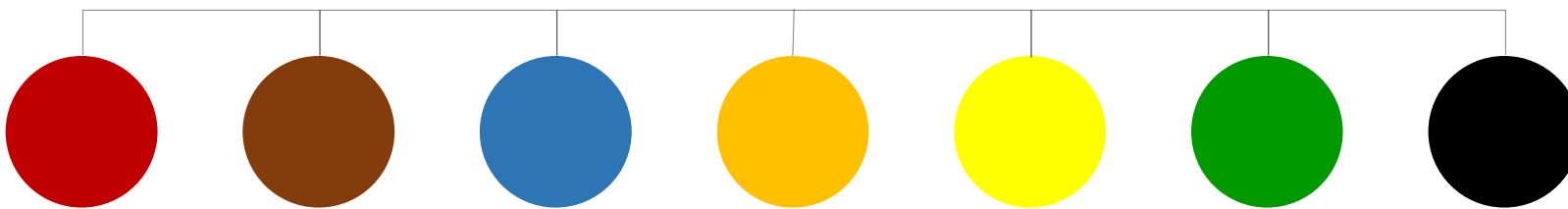


DIGITIZATION

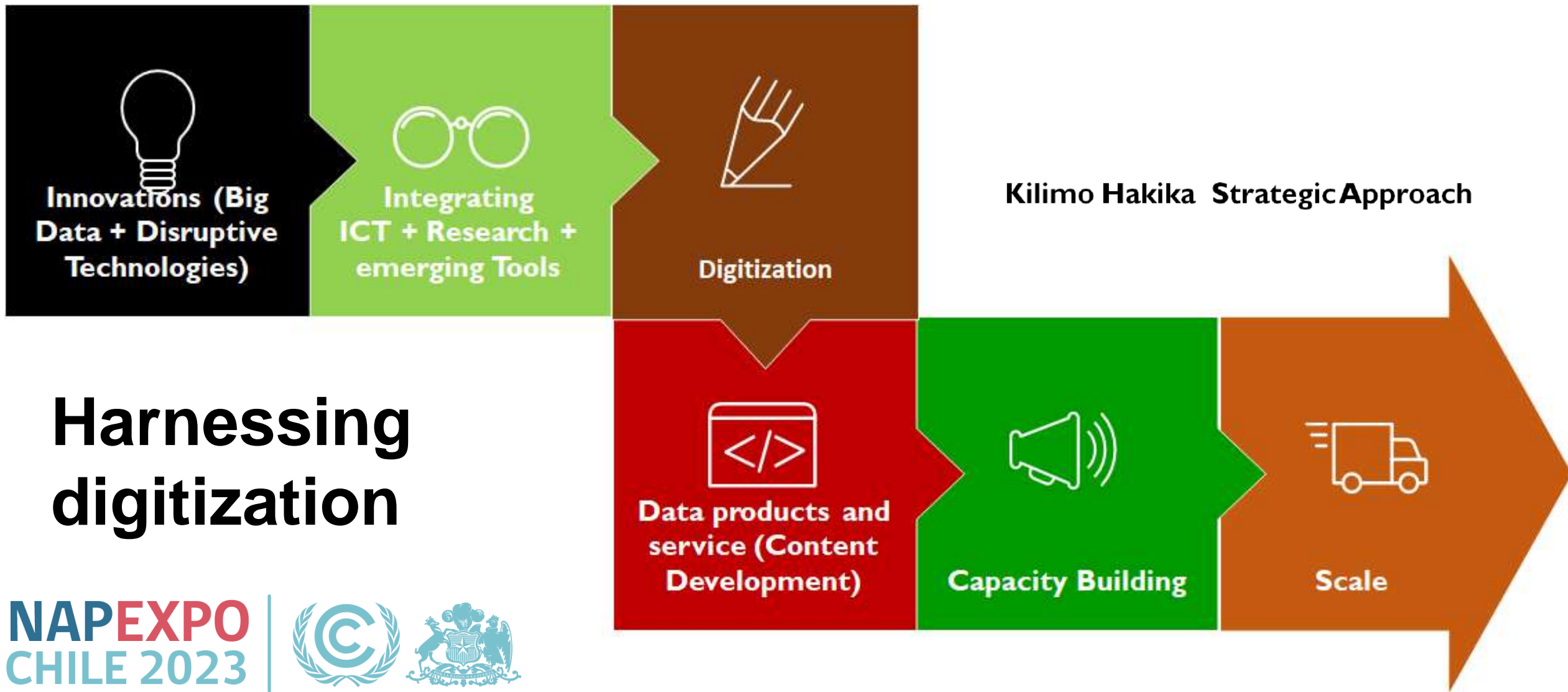
INNOVATIONS

DISRUPTIONS

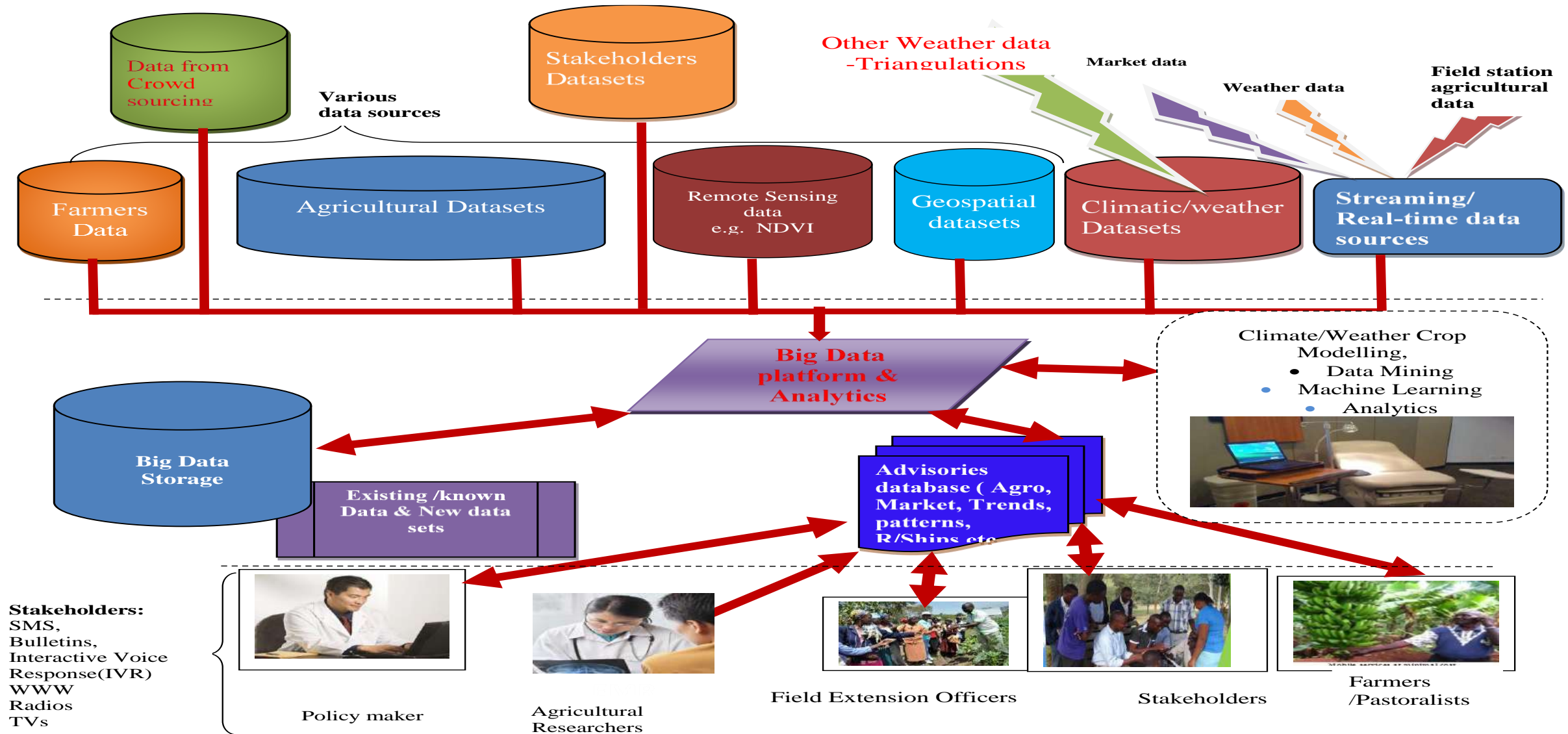
AGRICULTURAL INTELLIGENCE



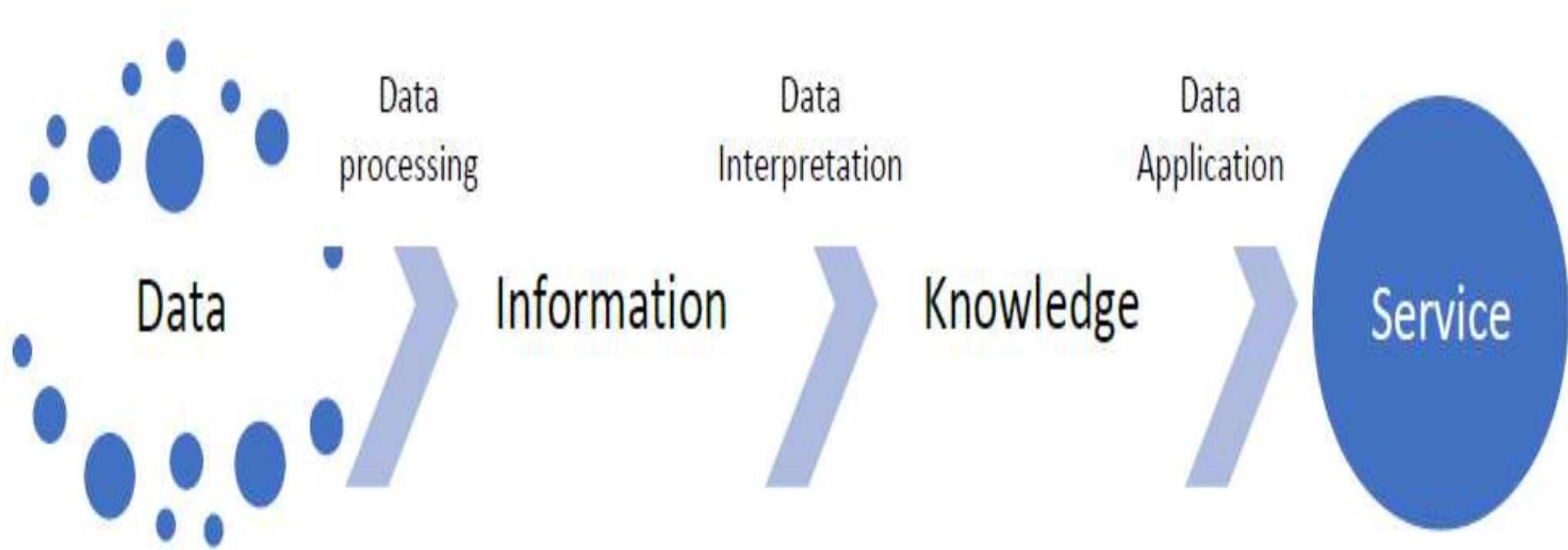
Key pillars: Embrace Technology and Data



Strategy 3: The Nexus of climate data and Agricultural data: Leverage of the Big Data & Data Ecosystem



The Success Factor: Turning Data into Service



Data cannot be used directly... but must be translated into services/Use Cases that can applied in the farm!

EXAMPLES of Key Data and Digital Interventions

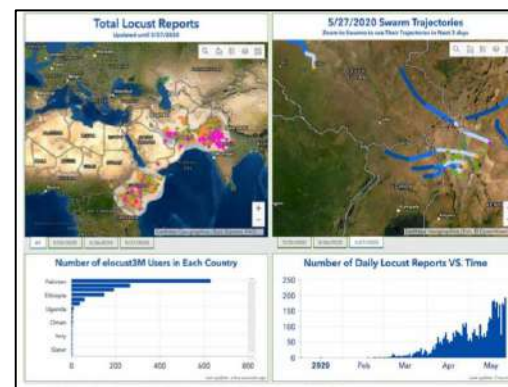
Kenya Big Data Center



Micro Weather Observatory



Desert Locusts warning and response



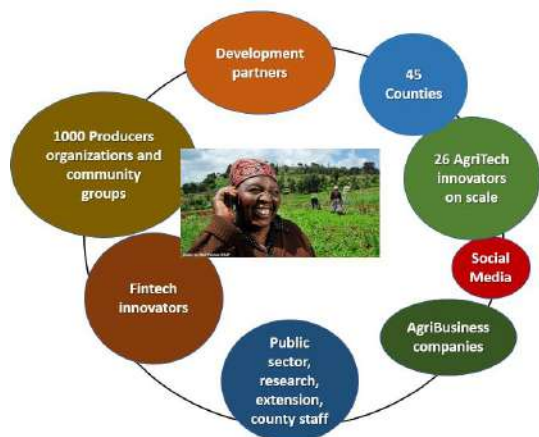
Farmers Digital Registry and Farm Geotagging



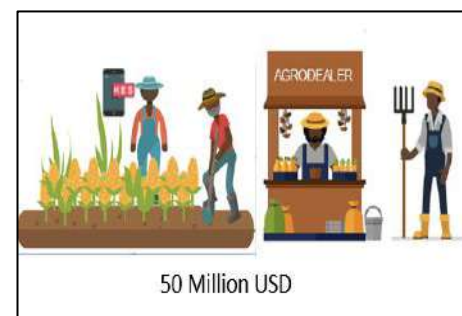
Digital Food Balance Sheet



One Million Farmers Platform



Digital e-voucher system



Digitizing Producer Organizations



Data As Public Good: Linking Private Sector to The Big data Platform

Productivity Track

- DigiCow
- Hello Tractor
- Digital Green
- Farmers Pride
- Precision Ag. For Development
- SunCulture

Market Linkages Track

- M-Shamba
- TruTrade
- One Acre Fund
- Farmshine
- Kuza Biashara

Financial Inclusion Track

- Acre Africa
- Pula
- Arifu
- Apollo Agriculture

Data Analytics

- Astral Aerial
- Oakar Services
- Ujuzi Kilimo
- AgroCares

Private Sector Engagement: One Million Farmer Platform

26 AgTech start-ups and innovators providing Data-driven Digital Agriculture solutions and services



DigiCow:
Uber of Veterinary Services



Hello Tractor: Uberizing farm mechanization



Digital Green: video-based extension service



AgroCares: IoT soil scanner



SunCulture:
Solar powered irrigation



TruTrade Africa:
Increasing Market access and price



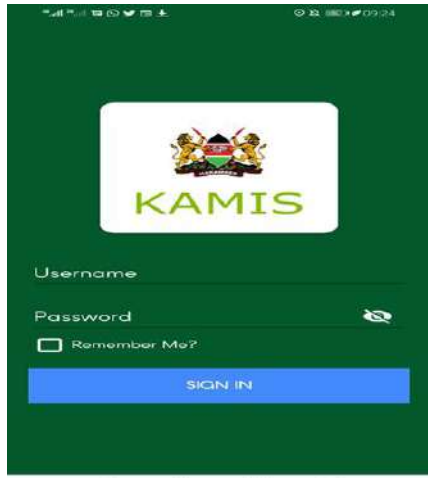
Digitally enabled supply chain finance: AgriWallet



Weather-index based Crop and Livestock insurance: ACRE Africa

Sourcing Digital Solutions through Innovation Challenge

Key Applications Benefiting Smallholder Farmers



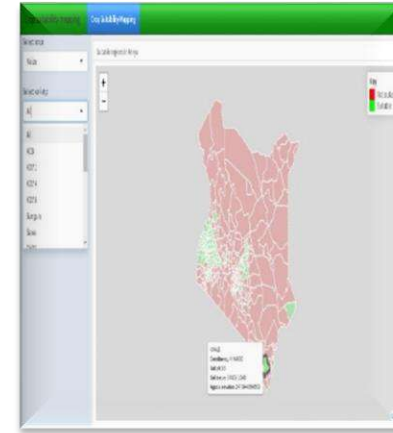
MARKET INFO. SYSTEM



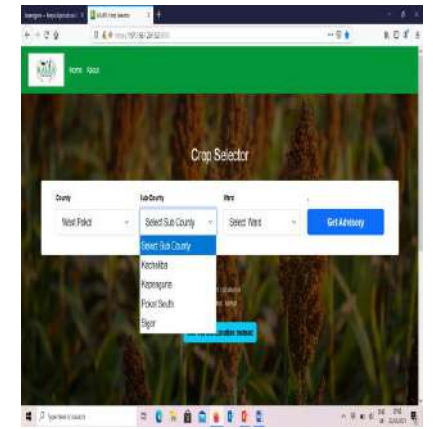
65 MOBILE APPS



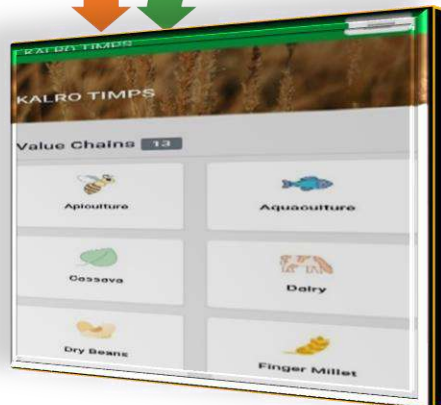
Digitized and Translated in Local Dialect



Crop/Livestock Suitability Mapping



Crop/Livestock/Pasture Selector

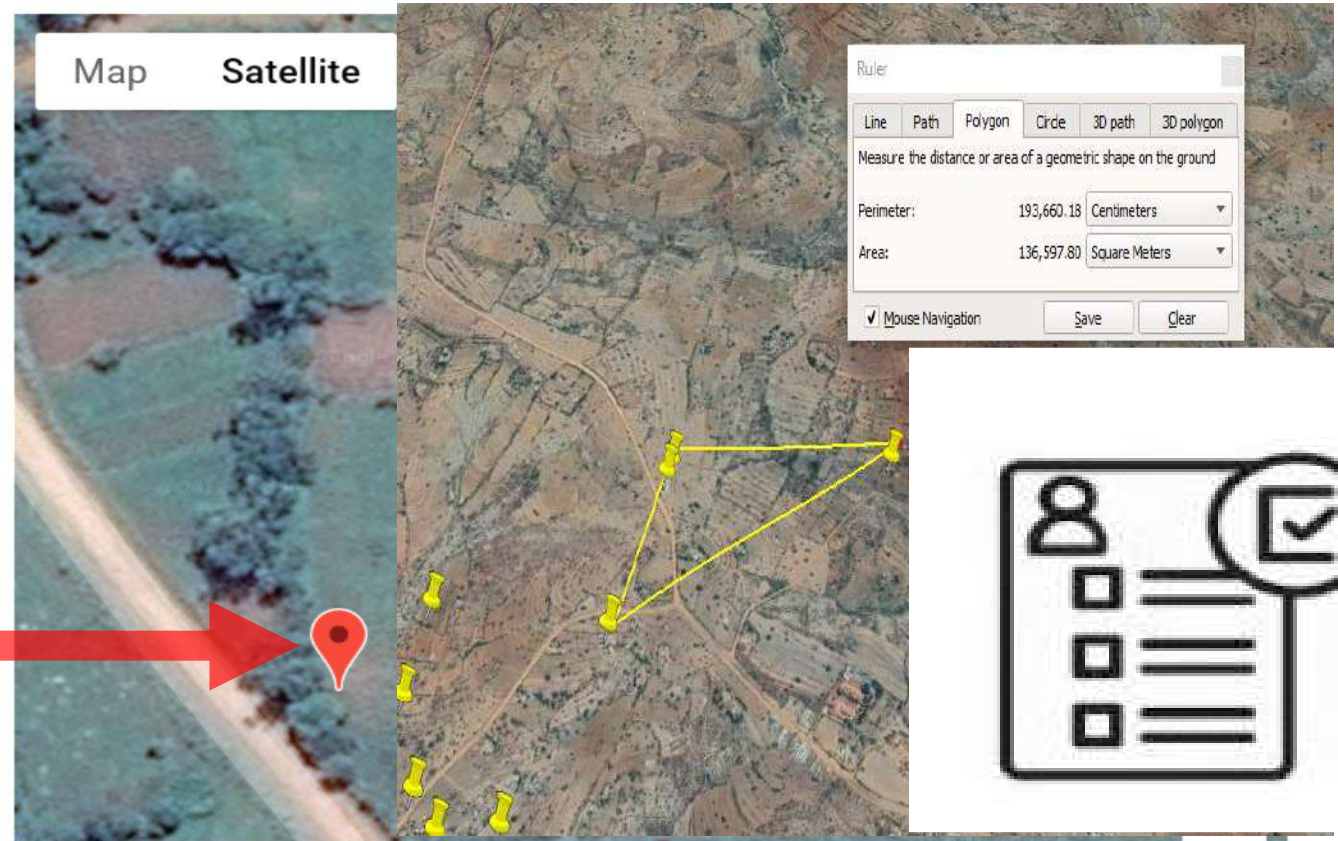


Personalized Advice to farmers



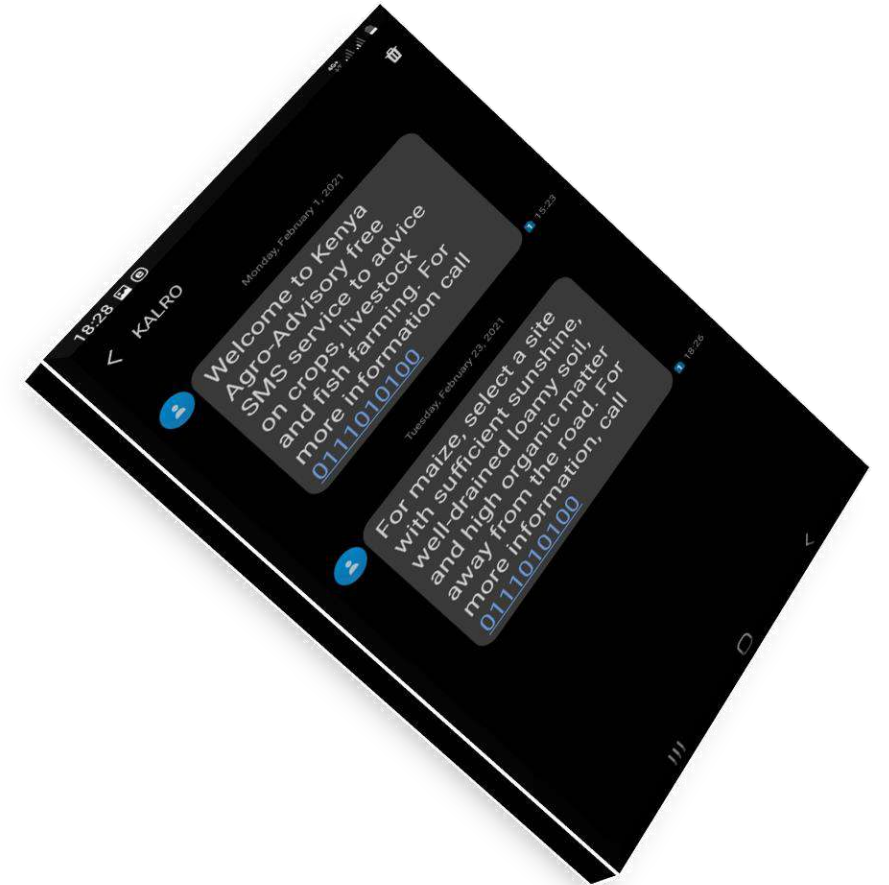
Establish an e-infrastructure: Geo referencing Farmers

- June Kwamboka
- Vihiga county
- Hamisi-Sub-county
- Banja ward
- Location
- Sub-Location
- Village



Geo-referencing -Supporting context specific +personally relevant integrated weather and market advisories

Application 1: Translated SMS services

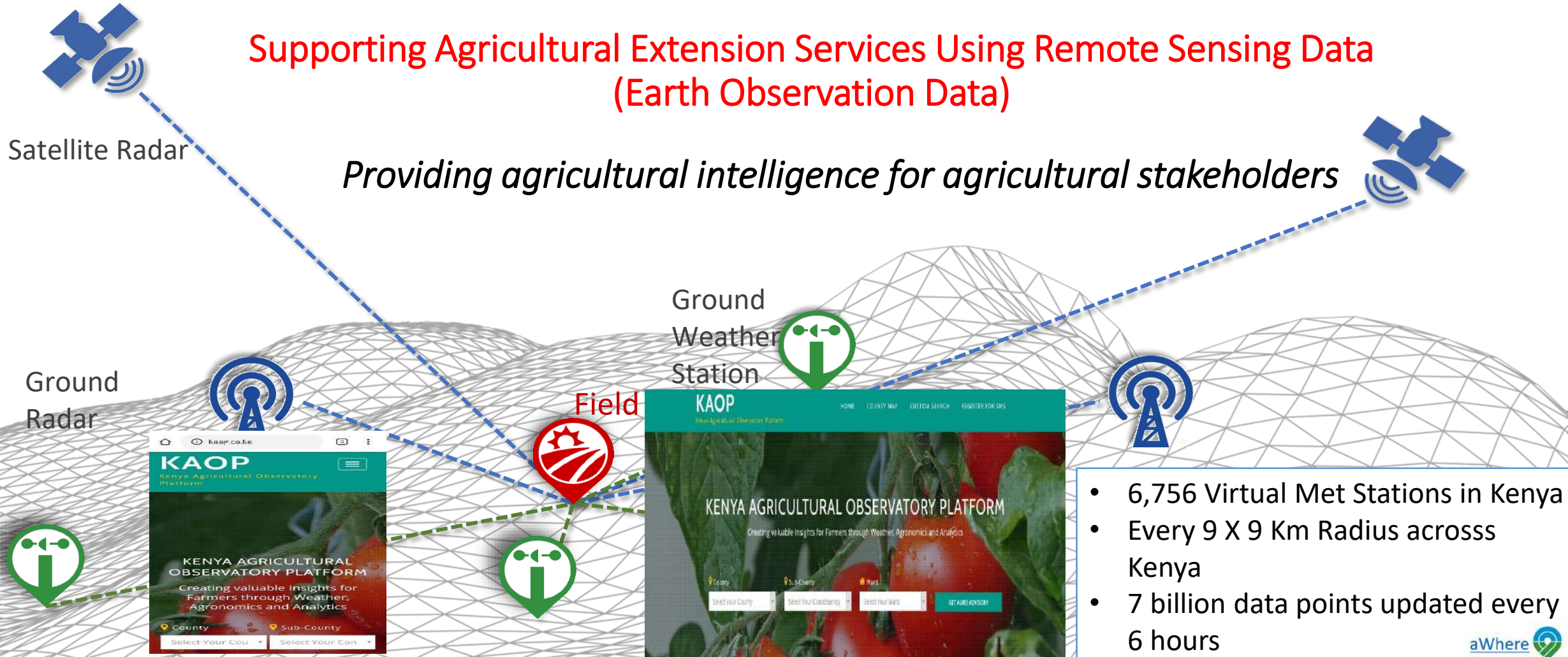


Farmer Engagement is key!

Application 2: Kenya Agriculture Observatory Platform

Supporting Agricultural Extension Services Using Remote Sensing Data
(Earth Observation Data)

Providing agricultural intelligence for agricultural stakeholders



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

Application 3: Kenya Agro-Advisory Call Center (Interactive Voice Response System)



Personalized Advice

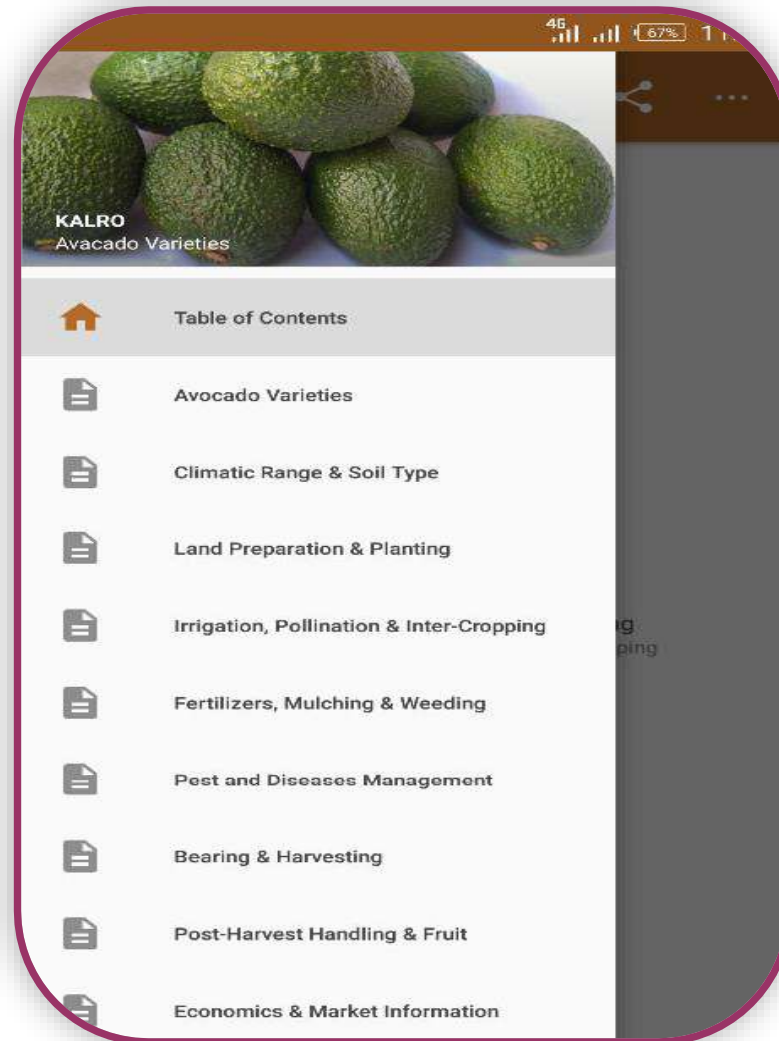


CALL CENTRE NO:0111010100

Application 4: Mobile Apps

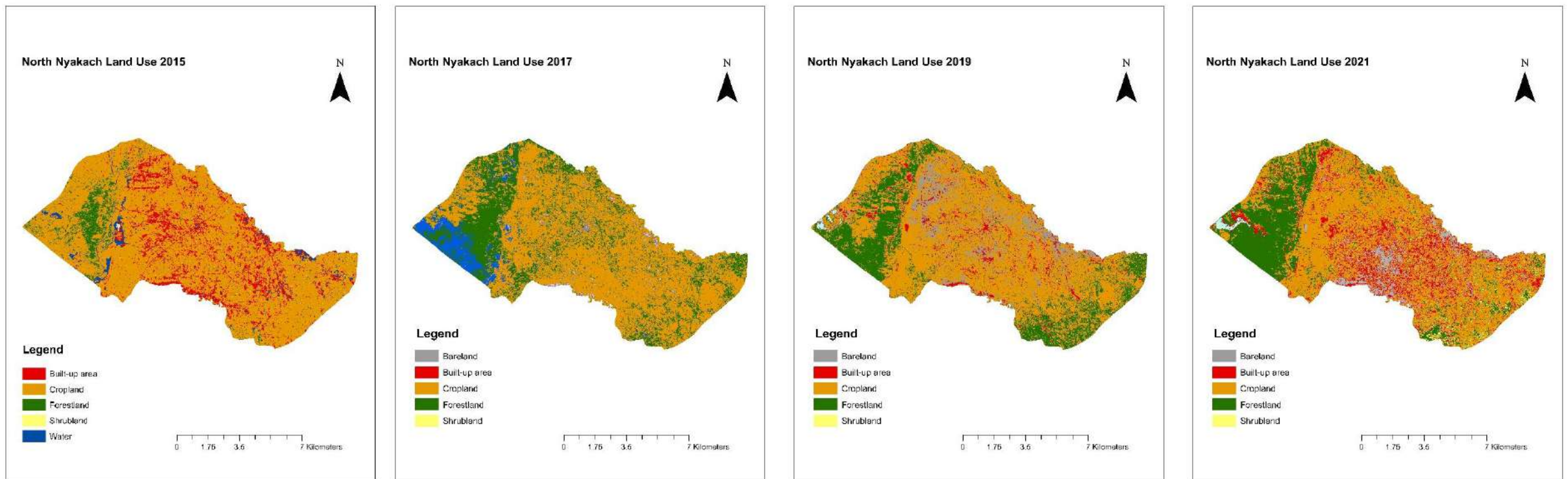
Opening Agricultural Research Data

- Site selection
- Land preparation
- Pre-planting
- Varieties
- Planting
- Water management
- Weed management
- Soil fertility
- Crop management
- Pest management
- Disease management
- Maturity
- Harvesting
- Storage
- Post-harvest handling
- Processing



Application 5: Earth Observation Data Cube

Land Use/ Land Cover Maps for any location in the country



North Nyakach Ward Land Use Maps (2015 - 2021)

Harnessing Digitization | Priority areas for investment

Key Lesson



**Digitization Strategy
Development**



**Turning agricultural data
into a service**



**Inspire Innovation,
Disruption + Actions**

Implications

- The strategy provides a clearer vision + targets
- Farmers + Stakeholders require services
- Be intentional on innovative solutions and Disruptive Agricultural technologies

Harnessing Digitization | Priority areas for investment

Key Lesson



Agricultural Intelligence



Capacity Building of farmers



Collaboration + Financial Sustainability Models

Implications

- The reality of Climate change Means agricultural intelligence is inevitable
- Improve capacities and practices of farmers to use digital solutions
- Collaborate to succeed
- Financial Sustainability models are required

International Development Partners



BILL &
MELINDA
GATES
foundation



'70% of the production needed to meet the growing global demand is going to come from technology.' (World Agriculture towards 2015 / 2030, rapport FAO 2008)

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THANK YOU