UNLOCKING THE POTENTIAL OF SMALL-SCALE FARMERS IN AFRICA USING SPACE TECHNOLOGIES

A pathway to enhancing Precision Agriculture for Food Security and Poverty Alleviation

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LocateIT Ltd is a Geo-ICT company that offers unmatched cutting-edge Space and Geomatics driven products, services and solutions.
mission
to provide highly sophisticated yet simple location-based ICT products and services that positively impact society

vision
to be a premier company that transforms communities in Africa through provision of innovative Geo-ICT solutions
WHAT WE OFFER:

- Space-driven products & services
- Geomatics products & services
- Integrated Geo-ICT solutions
- Environmental and developmental modeling services

( Climate change, REDD+, Land degradation, Suitability modelling for socio-economic planning & development,
  LULC change mapping & prediction, Early warning systems for food security & disasters, Monitoring & Evaluation services, etc)
OVERVIEW OF AGRICULTURE IN AFRICA

❖ Agriculture is the least digitized sector in Africa yet it accounts for the largest portion of Africa’s GDP

❖ Small-scale farmers constitute about 96% of the total population (Farming on less than 1/2 hectares of land)

❖ SDG 2 seeks to end hunger, achieve food security, improve nutrition and promote sustainable agriculture

❖ Space technologies are playing a fundamental role in supporting the growth of the African economy and boosting the global food and agricultural production
Majority of small-scale farmers have weak linkages and little or no access to information and external inputs.

Advanced technologies are prohibitive to small-scale farmers due to cost.

Q: Are current PA technologies feasible in Africa?
ADVANCES IN SPACE & GEOSPATIAL TECHNOLOGIES

Sensing Components

Sensors, Cameras
- RGB
- Hyperspectral
- Multispectral
- Thermal
- NDVI
- Infrared
- NIR

Platform
Airborne
- Satellite
- Piloted Airplanes
- UAV

Ground-based
- Handheld
- Vehicle mounted

Fixed wing
Multi-rotor
APPLICATION OF SPACE TECHNOLOGIES IN AGRICULTURE

Space technology application in Agriculture:

➢ Risk Management System for insurance purposes: climatic indexes/parameters across geographical areas used as variables for insurance policies
➢ Precision Agriculture and Precision Livestock
➢ Early warning and response systems
➢ Drought monitoring
➢ Irrigation management
➢ Biodiversity protection
Precision farming was originally developed for large farming units.

Precision agriculture is about optimizing returns on inputs while optimizing resources.

Management concept based on sensing, measuring, and assessment.

Precision farming enables farmers to determine the state of their crops and other variables needed for optimum crop production using satellites and their sensors to monitor land.
Precision Agriculture Focus:

❖ Crop monitoring: ie. crop condition assessments using NDVI
❖ Production estimates: early season crop acreage estimation to support timely production forecasts
❖ Yield Estimation: Crop-specific growth parameters to support improved crop yield forecasts
❖ Early warning – eg. Soil moisture mapping to monitor both extremes (drought & flooding)
❖ Disaster mapping: assessing the damage extent
Problem = Knowledge Poverty + Small scale farms + low inputs
County Agricultural Management Information System (CAMIS)

- **Farmer-centric** agriculture information management platform.
- Ecosystem of **tools** and **information services** that enable real time stakeholders connectivity and 360-degree **situation awareness** of the full Food Production cycle.
- Unified data flow of food production - enable stakeholders reliably **forecast pre and in-season** crop production as well as **trace** food production system.
Manage the Production Cycle

Production:
- Farmer registration
- Farm inputs
- Agriculture extension
- Subsidy delivery
- Farming activities documentation
- Crop forecasting
- Early warning
- Precision farming
- Logistics planning & deployment
- Credit/Financing
- Crop & livestock insurance

Delivery:
- Connect Farmers to Markets
- Contract farming
- Logistics planning & deployment
- Track produce destination

Marketplace:
- Estimate production
- Food pricing
- Food traceability
- Connect Markets to Farmers

Knowledge Partners
- Knowledge to farmers.
- Empower research with real time big data.
- Science to actionable information for farmers.
Mapping farms in Vihiga County, KENYA
As A farmer, I can...

**Opt-in to CAMIS**

```
camis RGU#30218977#Juma#Abdala Salim#male
```

**Add my farms**

```
camis RGF#30218977#4.1#Malaba Kwhisero#subsistence
```

**add my crops via SMS or USSD**

```
camis RGC#Juma/9770#BEANS#MAIN#LONG#1.6
```

Dear Juma, you've been registered with CAMIS. You can add your farms by sending farm details via SMS like this: [camis RGF#your id#size#place name#type]. For example, RGF#30218977#3.5#NGONG ROAD#commercial.

Farm registered successfully. The farm code is: Juma/9770 Use this code to add the crops you're planting in this farm by sending SMS with the crop details. For example, [camis RGC#Juma/9770#BEANS#MAIN#LONG#1.6]

Crop registered successfully. You can update crop details later.
More capabilities...

- Access Subsidies
- Report Disease & Pests infestation
- Document farming activities
- Access Specialized support
WAY FORWARD

❖ Develop Decision Support Systems (DSS) to provide site specific fertilizer requirements
❖ Investment in data (creation, compilation, analysis)
❖ Crowd-sourcing: Farmers can be a good source of information
❖ Increased access to fertilizers and credit (adoption of modern production practices)
❖ Investment in rural infrastructure and people-centered development (gaps in infrastructure ie. scarcity of roads, market centers can cause agricultural systems to fail or influence post-harvest losses.
❖ Innovative services and products
Call for partnerships with other agriculture industry players

- Geo-ICT
- Insurance
- Micro-finance institutions,
- Agro-chemical stores
- Spin-off Technology companies
Together Let’s Feed the Future ...