Digitization Coordination of Kenya’s Agriculture Sector Data

Policy Framework for Digital & Data Transformation in Agriculture

May, 2021
The Digitization and Coordination of Kenya’s Agriculture Sector Data is anchored on the 10-year ASTGS, which aims to support 100% food security.

ASTGS anchors and targets for first 5 years

Increase small-scale farmer incomes\(^1\) of ~3.3mn households and impact ~15 mn\(^2\) Kenyans

Increase food available year-round by unlocking > 500,000 acres of agricultural production and agro-processing across priority value chains (~KES 400Bn GDP boost across economy)

Boost household food resilience especially for the most vulnerable (~4mn during emergencies, 1.3mn chronically):
- reduce by 100% the number of food insecure Kenyans
- reduce the cost of nutritious food

The ASTGS identified 9 flagships to drive these outcomes. Detail follows

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\(^1\) Over the past ~10 years, incomes have grown 35%, below the pace required to meet SDG goal of doubling incomes between 2016-2030. If incomes are 145k today (~KES 400/day), without transformation in 5 years should grow to 170k (~KES 465/day) based on historical trends. Transformation is estimated to contribute an incremental ~30% to 230k (~KES 625/day).  

\(^2\) Assumes ~4.5 people per household

A vibrant, commercial and modern agricultural sector that supports 100% food security in the context of devolution by ensuring access and availability of nutritious food, at affordable prices for entire population
The 9 Flagships in the ASTGS

Working with the private sector as a true partner to design and implement ASTGS is a priority. With the right approach, ~80% of the costs can be financed through public-private partnerships.

“FARMER” Implies Small-holder, Pastoralist And Fisherfolk, Unless Stated Otherwise

<table>
<thead>
<tr>
<th>ASTGS Anchor</th>
<th>Flagships</th>
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<tbody>
<tr>
<td>Increase SSF income</td>
<td>1. <strong>Target 1 million farmers, pastoralists and fisherfolk with 1000 farmer-facing SMEs, supported by SME accelerators</strong></td>
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<td>2. <strong>Shift nationwide input support programme to e-vouchers for 1.4 million high-needs farming households</strong> for a range of inputs</td>
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<td>Increase ag output</td>
<td>3. <strong>Set-up 6 agro-processing hubs</strong> with a one-stop-shop PPP process for local and export markets</td>
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<td>4. <strong>Unlock 50 large-scale private farms (&gt;2,500 acres)</strong> with 150,000 acres under sustainable irrigation from existing infrastructure (e.g., rehabilitate dams)</td>
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<td>Boost household food resilience</td>
<td>5. <strong>Restructure Strategic Food Reserve (SFR) to serve 4 million high-needs Kenyans</strong> with digital reserve stock and cost management with private sector, and price stability managed by Treasury</td>
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<td></td>
<td>6. <strong>Boost food resilience of 1.3 million farming, pastoralist, and fishing ASAL households</strong> with community-driven design of projects, and coordination of funding in regional economic blocs</td>
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<tr>
<td>Enablers</td>
<td>7. <strong>Launch 3 knowledge and skills building programs focused on technical and management skills in the field</strong> for 200 national and county government transformation leaders, 1000 farmer-facing SMEs, and 3000 extension agents</td>
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<td>8. <strong>Strengthen research and innovation, and launch priority digital use cases for better decision making and performance management</strong> (e.g., first wave could include e-incentive registration &amp; delivery - flagship 1, automated SFR buy / sell needs - flagship 5)</td>
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<td>9. <strong>Actively monitor 2 key food system risks</strong>: i. sustainable and climate smart natural resource management; and ii. crisis management for pests and diseases, climate and global price shocks</td>
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The Agricultural Transformation Office (ATO) reporting to the CS was designed to coordinate and performance manage ASTGS implementation across the flags.
## Digital Strategy – 7 Digital Use Cases

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<tr>
<th>ASTGS Anchor</th>
<th>Digital use cases to champion until 2023, in line with ASTGS</th>
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<tbody>
<tr>
<td>Increase SSF income</td>
<td><strong>1.</strong> Accelerate farmer registration and target eligible farmers with e-incentives, using digital tools and analytics to improve tracking, and payment direct to providers(^1)</td>
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<td><strong>2.</strong> Improve farmer practices (e.g., input use) by providing farmers with customized e-extension that incorporates current and predictive data (e.g., agro-weather analytics, pest/disease trends, prices)</td>
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<td>Boost household food resilience</td>
<td><strong>3.</strong> Monitor emergency food reserve stocks with digital tools (e.g., 1D barcodes); then improve overall national Food Balance Sheet (FBS) data to determine future quantity of stock to buy (e.g., use satellite data, predictive analytics on production, trade, climate)</td>
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<td><strong>4.</strong> Make more dynamic trade and price stability decisions using the digital Food Balance Sheet &amp; an Early Warning System (EWS) for food price inflation</td>
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<td><strong>5.</strong> Improve value chain selection with an agricultural land optimization model(^2) that responds to specific outcomes (e.g., job creation, GDP contribution), and incorporates climatic expectations &amp; resilience data</td>
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<td>Cross-cutting support</td>
<td><strong>6.</strong> Drive M&amp;E with a dashboard to streamline data collection, and verification of ~10 transformation KPIs(^3) linked to the use cases</td>
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<td><strong>7.</strong> Establish standards and protocols for a shared data platform to facilitate more evidence-based interventions across all players(^4)</td>
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### Digital tools alone are insufficient to solve all the challenges identified on prior page. But they will support more holistic solutions (see ASTGS flagships)

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1 Use case should start focused on existing farmer profiles from on-going government programs (e.g., KCSAP, NARIGP), as complete more holistic Huduma and National Census process for farmer registration | 2 Integrate yield, weather / climate and soil data | 3 For example, yield by commodity by location, compared to target | 4 Should start with government agencies (e.g., ZAMIS in Zambia), then expand to development partners and private sector players as establish data interoperability standards and protocols

\(^*\) SOURCE: Expert interviews, World Bank; Tegemeo
**Initiative 1:** Using Data and technology to respond to the biggest Desert Locusts invasion in ~60 years

**Digital Dashboards**

**Impact**

Locust swarms arrived in Kenya in December 2019 from Somalia and Ethiopia, and spread to 28 counties; first time an invasion of this size was seen since 1960s

Land area affected by locusts to date is estimated to be 173,000 Ha (sprayed 78,000 Ha), comprising of 70% range land and 30% crop land

Post-invasion impact analysis ongoing, however it is estimated that:

- Losses on land for livestock pasture ranged between 15% to 40% in the affected counties
- ~5,400 ha of cropland impacted. There was limited impact on crops as the locusts arrived during/after the harvest season

Source: Gro Intelligence, MoALFC, Expert input, Rapid report on locust assessment
Initiative 2: Digital Food Balance Sheet implemented in September 2019, ongoing updates for Data Automation

Kenya’s Digital FBS

What it includes:

Stocks  
Current level of maize supplies across multiple stockholders (government, private sector, relief)

Production  
Forecast of this season’s expected production

Trade  
Both formal and informal flows of grain across the border with neighbouring countries

Consumption  
Expected maize consumption by region

Food Balance  
The “net effect” of all supply/demand drivers to understand the total current balance sheet

fbs.kalro.org
Initiative 3: E-Voucher Programme

1. MoALFI sets up cloud-based farmer database and e-incentive software at KALRO, with mechanism to integrate existing databases onto one e-incentive platform.

2. Agrodealers and extension service providers register with e-incentive program via smartphone application.

3. Farmers register with e-incentive program through agrodealers and extension service providers.

4. MoALFI and counties send e-voucher annually to phones of eligible farmers.

5. Farmer unlocks the incentive by communicating with extension officer who advises on best inputs (according to e.g., commodities and hyper-localized weather and/or soil testing).

6. Farmer matches incentive amount to unlock the incentive and buys inputs from agrodealer using e-voucher.

7. System automatically captures input traceability data (ideally all inputs are market with scratch/QR codes to eliminate counterfeit products).

8. KALRO sends annual USSD survey to farmer to record geo location and reported yield data.

9. Performance monitoring team at KALRO assesses impact of incentives against KPIs and draw insights from yield estimates and publishes reports.

10. MoALFI decision-makers use latest insights to target future e-incentives.

11. MoALFI updates targeting criteria on the e-incentive platform.

1. Eligibility criteria may include e.g. farmers with <0.5 Ha land, <KES 150,000 income per year.
2. E.g. KCEP CRAL and E-input subsidy (DigitFarm) programs.
3. See proposed partnership framework.
Data Collaboration in Agriculture
COVID-19 FSWR engaged & coordinated ~50 stakeholders; KUADP brings this same model for coordination to Data & Digital Innovation
Kenya Unified Agriculture Data Platform for a data driven decision-making organisation

Data Driven Decision Making / Intelligence Driven Organisation

Working with Microsoft to develop the Agriculture Digital Transformation Roadmap

Cloud based Data Architecture and Capacity Enhancement
## Challenges & Solutions

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<tr>
<th>Category</th>
<th>Solution</th>
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<tr>
<td>Skills</td>
<td>Current level of skills are limited; both retooling &amp; increased collaboration with the private sector required</td>
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<td>Enabling Environment</td>
<td>Steering Committees are temporary, there needs to be a more comprehensive enabling environment with our ICT counterparts &amp; Private Partners</td>
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<td>Collaboration/Partnerships</td>
<td>Longer term Partnerships and Collaborative interventions are required to support continued digitization &amp; data automation within the sector</td>
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<td>Innovation</td>
<td>Deploy more flexible engagements to allow for through-flow of innovations &amp; innovators to and within Government</td>
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<td>Sustainability</td>
<td>Resource availability and realigning of budgets towards creating a robust digitally enabled work conducive for a Data Driven policy environment</td>
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Thank You!