ACAI and EiA 2030
Sustaining the use of AKILIMO

AKILIMO
we know cassava
Cassava growers obtain higher profits by applying recommendations received through the AKILIMO service.

AKILIMO inspires the development of new solutions within the digital agriculture community (incl. EiA 2030).

ACAI Jan 2021 – Jun 2022
Sustaining AKILIMO through integration of tools, principles and approaches in new agronomy programs and ongoing partner initiatives
Excellence in Agronomy 2030 (EiA 2030):
Taking locally relevant agronomy to Scale in the Global South
‘Agronomy Program Assessment’ (APA) Report: More than 130 agronomists engaged in more than 140 initiatives; about 10-15% of the current total CGIAR budget; nearly all funds through time-bound projects
Vision: ‘To achieve agronomic gain for millions of women, men, and young smallholder farmers in the Global South, with positive impact on food security, income, and soil health under climate variability’

Purpose: ‘To galvanize a CGIAR-wide, integrated framework to identify, diagnose, and resolve yield limiting factors using data-driven agronomy solutions at scale for smallholder farming systems, in response to demand from the public and private sector investing in the Sustainable Intensification of these systems’
Agronomy at scale – Resolving the conundrum of being locally-relevant while working for millions of people on millions of ha

The science of **integrative soil and crop management** (the **10-20 decision** that farmers make on a seasonal basis) that accounts for **spatial and temporal variability** towards **targeted advisories** that account for **yield, profitability, risk, and sustainability**, and the diverse requirements of **end users**

→ **G**enotype) x **E**(nvironment) x **M**(anagement) applied to farming systems managed by a large number of diverse smallholder farming communities on large areas of variable land under a changing climate
Agronomic gain - Targeting specific agro-ecologies/countries with a set of KPIs aiming at Sustainable Intensification:

1. **Increased yields/profitability** for key crops → SS-Africa, S-Asia
2. Improved **resource use efficiencies** → areas with relatively good yields
3. Increased **yield stability** → areas affected by climate variability
4. Improved **soil health** → addressing soil degradation
Structure and internal organization

**ORGANIZE**
Organization, capacity development, performance management
- Organization of communication and advocacy
- Development of capacity of local partners
- Facilitation of centers to share services
- Monitoring & evaluation of EIA performance

**PROJECT 1**
Hosts functions related to internal organization & external partnerships
- Tracking of demand from private & public partners
- Prioritization of demand using ex-ante analytical approaches
- Administration of partnerships under the DELIVER modules

**PROJECT 2**

**PROJECT n**

**TRANFORM**
Excellence in agronomy research engine
- Hosts past, current & novel data plus analytical capacities
  - Primary & secondary data on agronomy and soil health
  - Advanced statistical, simulation modelling, and geospatial tools
  - Farming system analytics and farmer segmentation
  - Decision analytics, with risk assessment information
  - ‘Turn-key’ solutions for transfer of approaches to crops/geographies
  - Workflow for ‘speed agronomy’

**INNOVATE**
Addresses key knowledge gaps & facilitates innovation in agronomy R&D
- Generation of data & tools required to fill key knowledge gaps identified through the DELIVER Module
- Facilitation of innovation in agronomy R&D at scale to create new demand
- Collection of key data that are required for under-research crops
- Facilitation of specific studies of common interest for which the CGIAR presents a comparative advantage
- Facilitation of the engagement of Advanced Research Institutes to fill key gaps in skills, expertise, data, and tools

**DELIVER**
Hosts the delivery of services & products to partners towards improved productivity, climate change resilience, and sustainability
- Development of workflows in response to priority Use Cases
- Deployment of existing data and tools Co-creation of solutions
- Facilitation of feedback loops to TRANSFORM
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Cassava growers obtain higher profits from cassava farming by applying recommendations received through the AKILIMO service. AKILIMO inspires the development of new solutions within the digital agriculture community (including the EiA 2030 Initiative).

Constraints
- Sustained use of the AKILIMO toolset is not secured.
- Use and uptake of decision support tools in agriculture are constrained by a myriad of factors, and more so in a smallholder context.
- Effective generic design and delivery of advisory tools is challenging due to need for high levels of customization required.
- User competences and preferences often mismatch with system capabilities of service providers and research-defined requirements for optimizing agronomic advice.

Opportunities
- ACAI advanced the state-of-the-art in agronomy-at-scale by developing new tools and approaches.
- The Excellence in Agronomy 2030 Initiative can integrate and continue building the tools and knowledge developed by ACAI.
- The AKILIMO advisory service can serve as a model or inspiration for the use cases of the EiA 2030 DELIVER module.
- Digital partners have integrated AKILIMO in their services.
- AKILIMO offers opportunities to gain rapid insights from thousands of users.

Interventions / Outputs
- Interfaces to AKILIMO recommendations are further improved and continued use of the final versions is sustained.
- Supplementary materials are bundled into training and promotion modules and continued use is sustained.
- Primary and secondary partners, digital partners, NARS and national extension services continue to apply the tools without direct project support.
- Insights are gained from large-scale ME&L surveys on how to optimize the use and uptake of AKILIMO advice among different gender categories.
- The impact of bundling agronomic advice with other services (incl. linkage to input-output markets) is evaluated.
- New and ongoing partners evaluate and update the content of their services to smallholder cassava growers.
- The SanDMan data collection system is generalized, fully documented and expanded for use beyond cassava.
- The modelling framework underlying the AKILIMO decision support tools is generalized, fully documented and expanded for use beyond cassava.
- The research methodology, approaches, tools and infrastructure are shared with the wider agronomy-at-scale community.

Intermediate Outcomes
- Cassava growers can continue to access agronomic advice delivered through the AKILIMO service.
- New and ongoing initiatives apply lessons learnt from AKILIMO to deliver tailored agronomic advice to smallholders.
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Primary Outcomes
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1.1 AKILIMO interfaces sustained

Hi! It’s Arifu. Pick a number to start learning:
1. Land preparation
2. Applying fertilizer
3. Intercropping
4. Planned planting
5. More

Choosing the right time to plant and harvest your cassava is one of the most important decisions to make. The next year’s yield partially depends on when you plant and harvest. Consider these 3 aspects:

- Health of vines
- Planting and harvesting season
- Cassava changes its growth dependent on when it receives rain (see examples below). You must consider the seasonal pattern to decide when to plant and harvest your cassava crop.

Scheduled Planting and Harvest Recommendations for Cassava

Impact of Weather

Cassava changes its growth dependent on when it receives rain (see examples below). You must consider the seasonal pattern to decide when to plant and harvest your cassava crop.

- Example 1: Planting at the beginning of the rainy season
- Example 2: Planting in the middle of the rainy season
• Improved decision logic and modelling framework using validation exercise data.
• Improved UX based on use and uptake survey feedback.
• Printable decision guides improved and available in local languages
• AKILIMO android app further improved
• AKILIMO recommendations tested and available on...
  ○ VIAMO’s 321 service
  ○ Arifu’s chatbot
  ○ eSOKO’s services
• AKILIMO functionality expanded to new countries or regions
• Sustainability plan implemented to maintain interfaces
1.2 AKILIMO training modules
• Promotion bundles to attract new organizations
• ‘Basic’, ‘intermediate’ and ‘advanced’ training modules for organizations to conduct training-of-trainer workshops for extension workers
• Training modules for extension workers to instruct farmers to use AKILIMO interfaces and apply AKILIMO recommendations
1.3 AKILIMO used without project support
1.3 AKILIMO used without project support

• Primary partners supported with training and materials to continue applying AKILIMO tools and supply advice to farmers
• Access to AKILIMO tools and training support for new organizations
• Sustained advisory services by digital partners
• Integration of AKILIMO into national extension services
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Overall use and uptake
Pie donut plots with use of the DS tools in the pies, and uptake of the recommendations in the donuts

2.1 Lessons from ME&L for new initiatives
• Integrated feedback mechanisms
• Rapid feedback surveys
• Detailed ME&L surveys
• Panel studies with returning users
• Insights in gender dimensions
• Citizen science-based approaches to gain soft user feedback as well as hard data (esp. georeferenced yield data)
• Feedback and insights used to improve decision logic and UX
• Lessons learnt on how to best tailor agronomic advisory services to maximize use and uptake shared with digital agronomy community.

2.1 Lessons from ME&L for new initiatives
2.2 Bundling agronomic advice and other services
2.2 Bundling agronomic advice and other services

- Models for bundling services revised with AKILIMO content
- Partner pilots in Nigeria and Tanzania
- Impact of bundling services on use and uptake documented
2.3 Lessons for co-creating agronomy content
• Learnings from AKILIMO within the ACAI partnership, and derived lessons for future initiatives presented to key players in the digital agronomy community.
• A scoping study conducted with potential partners to gauge third party interest, commitment and requirements for integration of AKILIMO in their services.
• Lessons integrated in the tools, methods and approaches applied in the DELIVER module of the Excellence in Agronomy Initiative.

2.3 Lessons for co-creating agronomy content
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3.1 SAnDMAn: Smart Agronomy Data Management
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- Expand to other crops
- Available to anyone
- Training & documentation
- Friendly processing
- Push to Open Access DB
3.2 Coupled modular modelling framework
3.2 Coupled modular modelling framework

- Start simple and immediately end-to-end
- Modular setup and stepwise development
- Apply principles that apply to all crops
- Leverage digital soil and weather data
- Crop modelling as core process
- Machine learning techniques
- Net revenue optimization
- Guided by user demand
- Define data requirements
3.3 Research procedures documented and training
3.3 Research procedures documented and training

- All ACAI findings published in OA research journals
- An agronomy-at-scale manual is published (contributing to the output of the EiA Initiative)
- NARS partners apply capabilities in digital data collection, modelling, GIS and data analysis in other NARS-led initiatives
Validating DSTs as a turnkey solution

What effort would it take to turn our approach into a generic “toolbox” to validate DSTs?

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<thead>
<tr>
<th>Key component</th>
<th>recognized by partners</th>
<th>Casava</th>
<th>Other comp</th>
<th>Plantrig</th>
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<tr>
<td>1 Partnerships</td>
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<td>2 Agreements and protocols</td>
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<td>3 Validation design</td>
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<td>4 Customized tools</td>
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<td>5 Sampling framework</td>
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<td>7 Quality assurance/additional data</td>
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<td>8 Input costs and produce prices</td>
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<td>9 Trainings</td>
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<td>10 Monitoring</td>
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<td>11 Reward payments</td>
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<td>12 Electronic data collection (ODK forms)</td>
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<td>13 Barcoded ID cards</td>
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<td>14 Data management system</td>
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Thank you!