IITA

Transforming African Agriculture

CGIAR

IITA RWANDA Booklet

December 2025

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IITA
RWANDA
Booklet

LIST OF
ABBREVIATIONS AND ACRONYMS

CBSD:	Cassava Brown Streak Disease
CGIAR:	Global research partnership focusing on transforming food, land, and water systems in a climate crisis
CIMMYT:	International Maize and Wheat Improvement Centre
CMD:	Cassava Mosaic Disease
CSEs:	Cassava Seed Entrepreneurs
EGS:	Early Generation Seed
EiA:	Excellence in Agronomy
GAP:	Good Agronomic Practices
HQCF:	High Quality Cassava Flour
HQCP:	High Quality Cassava Peels
IITA:	International Institute of Tropical Agriculture
INGABO Syndicate:	A consortium of cassava farmers in Rwanda
IPSR:	Innovation Packaging and Scaling Readiness
MEDA:	Mennonite Economic Development Associates
MINAGRI:	Ministry of Agriculture and Animal resources
RAB:	Rwanda Agriculture and Animal Resources Development Board
RICA:	Rwanda Inspectorate, Competition and Consumer Protection Authority
SAH:	Semi Autotrophic Hydroponics
SDGs:	Sustainable Development Goals
SNS:	Smart Nkunganire System
ViRCA Deployment:	Virus Resistant Cassava for Africa Deployment
WUR:	Wageningen University & Research

WORD FROM THE COUNTRY REPRESENTATIVE

Dear readers,

It is with great pleasure and excitement that I welcome you to this booklet, a testament to the remarkable work and achievements of the International Institute of Tropical Agriculture (IITA) in Rwanda.

As one of the 15 CGIAR research centers, IITA has upwards of half-a-century of experience in steadfastly transforming African agriculture through research and innovation. With 5 research and administrative hubs and 31 stations across 28 African countries, and working closely with national and regional partners, IITA is uniquely positioned to meet what the continent requires where and when it is required, by delivering our research products directly to nations and communities.

IITA has a long history of collaboration with the Rwandan agricultural sector dating back to the 1980s. Achievements from this collaboration are many and varied.

In Rwanda, IITA's work is a demonstration of the power of collaboration. We invest in technological and institutional innovations, partnerships, capacity development, and policy engagement to contribute to Rwanda's agricultural transformation. Our operations in Rwanda are in close collaboration with the Ministry of Agriculture and Animal Resources (MINAGRI), the Rwanda Agriculture and Animal Resources Development Board (RAB), Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA), civil-society organizations, academia, development partners, and the private sector.

Following extensive and intensive consultations, in 2024, IITA designed and launched its 2024–2030 Strategy entitled Science, Research and Delivery Innovations for African Agrifood System Transformation. This new strategy reinforces IITA's strong role in redirecting CGIAR in the continent. It emphasizes the need for reorienting IITA's strategic focus to include climate-resilient agriculture, in addition to improved health and nutrition. We are working with RAB and MINAGRI to operationalize the strategy in Rwanda by identifying transformative and impact-driven interventions aligned with MINAGRI's Fifth Strategic Plan for Agriculture Transformation (PSTA 5).

This booklet is a celebration of our collaborative efforts. It provides an overview of the major research and delivery initiatives implemented in Rwanda with different stakeholders. It stands as testimony of our commitment to continue supporting the Government of Rwanda's priorities, and our recognition of the crucial role of partnerships in scaling science and innovation. You, our esteemed readers, are an integral part of this journey.

As you read through this booklet, I encourage you to consider how we can work together to make Rwanda's food systems more productive, nutritious, inclusive, and resilient to climate change. Please feel free to share your thoughts on potential partnerships. I look forward to hearing from you.

Matieyedou Konlambigue
Country Representative

An aerial view of the International Institute of Tropical Agriculture (IITA) Headquarters in Ibadan, Nigeria

ABOUT **IITA**

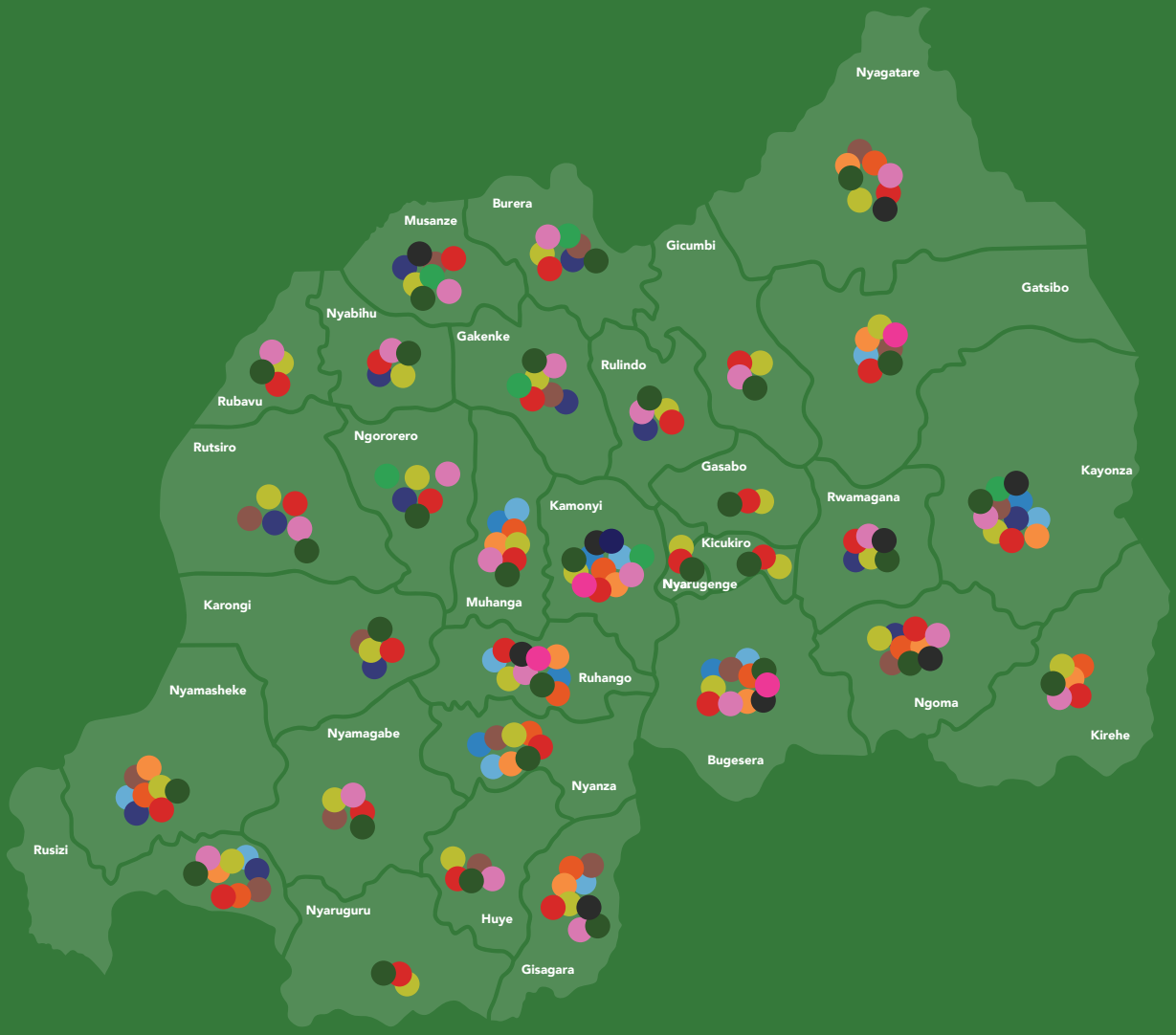
The International Institute of Tropical Agriculture (IITA) is Africa's leading agricultural research-for-development institution and a key member of the CGIAR global research partnership. Guided by its 2024–2030 Strategy, IITA works to transform African agrifood systems to become more productive, inclusive, nutritious, climate-resilient, and sustainable. Its mission is to remain the continent's foremost research and delivery partner, providing science-based solutions that address food insecurity, poverty, malnutrition, environmental degradation, and unequal opportunities for women and youth.

Across sub-Saharan Africa, IITA integrates cutting-edge science with large-scale delivery through its dual approach of Research-for-Development (R4D) and Partnerships-for-Delivery and Scaling (P4D/S). The Institute focuses on priority crops central to African diets and incomes: cassava, maize, banana and plantain, soybean, cowpea, and yam; while advancing resilient agrifood systems, soil health, climate-smart agriculture, and nutrition-sensitive interventions.

By 2030, IITA aims to support average yield increases of at least 25% for its mandate crops in priority areas, contribute to closing the living income gap for more than 50 million Africans, improve access to diversified and nutritious diets for at least 25 million people, and influence the creation of over 10 million decent jobs, particularly for youth and women.

IITA operates through a strong regional presence, with five Africa-wide hubs (West Africa, Sahel, East Africa, Central Africa, and Southern Africa) that connect research excellence with country-level delivery and partnerships. Working closely with governments, national research systems, the private sector, NGOs, and farmer organizations, IITA accelerates the journey from innovation to impact at scale, ensuring that scientific solutions respond to real-world challenges faced by smallholder farmers and agribusiness actors.

WHERE WE ARE
IN RWANDA



LEGEND

- ViRCA Deployment Project
- Gwiza Muhinzi Project
- AID-I GLR Project
- 1000Farms Project
- CASS Project
- CBSD/CMD Control Project
- CIALCA Project
- Excellence in Agronomy Project
- N2Africa Project
- ICT4BXW Project
- Live Food System Monitor Project
- Aflasafe Project
- RUNRES Project
- CANALLS Project

IITA PROJECTS IN RWANDA

1. ADVANCING CROP VARIETIES AND DEVELOPING SUSTAINABLE SEED SYSTEMS

IITA has been investing in crop improvement, pest, and disease management as part of its effort to strengthen the country's seed systems by aligning research with strategic interventions across key food-security crops. These include cassava, bananas, maize, and soybeans. Working with RAB and other partners, IITA led research to develop and disseminate improved varieties resistant to two devastating cassava viral diseases: cassava brown streak disease (CBSD) and cassava mosaic disease (CMD). IITA is also collaborating with RAB, RICA, and private seed companies to enhance the availability and accessibility of high-quality seeds to Rwandan farmers.

1.1 VIRUS-RESISTANT CASSAVA FOR AFRICA DEPLOYMENT (VIRCA) PROJECT

Period: 2022–2026

Goal:
Provide smallholder farmers with high-performing, disease-resistant cassava varieties and establish effective cassava seed systems to improve food and economic security.

Overview

The ViRCA (virus-resistant cassava) Deployment Project, jointly led by the Mennonite Economic Development Associates (MEDA) and IITA, is committed to establishing a robust and sustainable cassava seed system in Rwanda. Building upon the successes of previous initiatives, ViRCA deployment works to strengthen the cassava value chain in Rwanda to benefit local actors and consumers in general.

The project aims to build capacity for early generation seed (EGS) production, develop national cassava seed quality assurance systems, and establish a sustainable network of cassava seed entrepreneurs (CSEs), and business incubation.

The ViRCA Project's operations are premised on a consortium of partners, including RAB, RICA, INGABO Syndicate (a consortium of cassava farmers in Rwanda), IITA, and MEDA Rwanda. The project spans six districts across eastern and southern Rwanda, namely: Bugesera and Kayonza (eastern), and Kamonyi, Muhanga, Ruhango, and Nyanza (southern).

The project provides training, mentorship, and technical capacity-building to RAB's cassava seed units to enhance their commercial capabilities through improved record-keeping, marketing strategies, demand forecasting, and production planning. Additionally, the ViRCA Project has embraced good agronomic practices (GAPs) and cassava seed planting techniques.

Achievements

Build capacity for early generation seed production through the installation of a semi autotrophic hydroponics (SAH) screen house at RAB's Rubona station

Capacity strengthening for RAB staff to speed up cassava macro-propagation using SAH technology in controlled environment to address the challenges of limited availability of high-quality cassava pre-basic seed in Rwanda.

RAB technicians trained in pre-basic seed production and management techniques (pencil stems, etc.).

The project collaborates with RAB to conduct distinctiveness, uniformity, and stability (DUS) assessments of elite cassava clones, and demand-creation trials for variety release and registration.

Develop national cassava seed quality assurance systems

Collaborative efforts with RICA are in place to bolster national seed quality assurance systems. This involves refresher training on cassava seed inspection and certification, implementation of cassava inspection protocols, seed tracking and traceability, pest and disease management, and understanding the cassava seed value chain. The project integrates the use of inspection technologies to elevate the quality of cassava seeds.

Developed protocols and technical regulations to operationalize cassava seed inspection and certification.

Delivered specialized PlantVillage Nuru application training to 52 cassava seed entrepreneurs and RAB technicians for mobile pest and disease identification. Nuru is a mobile AI assistant that works inside a standard smartphone and is capable of accurately diagnosing cassava diseases offline, without an internet connection.

Trained 28 seed inspection professionals (8 RICA staff and 20 private inspectors) on certification standards, field inspection protocols, and diagnostic procedures, including familiarization with the Plant Village Nuru application.

Delivered loop-mediated isothermal amplification (LAMP) technology for cassava pests & diseases diagnostics, and trained RICA and RAB laboratory technicians and selected seed inspectors on its use.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor: Gates Foundation

1.2 GWIZA MUHINZI PROJECT: ENHANCING CASSAVA PRODUCTIVITY AND UTILIZATION FOR FOOD AND INCOMES OF SMALLHOLDER FARMERS IN RWANDA

Period: 2023–2026

Goal:
Promote food and nutrition security and resilient food systems in Rwanda by enhancing cassava productivity, diversifying cassava utilization through value-added innovations, and supporting coordinated investment in the cassava value chain.

Overview

The Gwiza Muhinzi Project is implemented by the INGABO Farmers Syndicate and IITA. The project seeks to improve cassava productivity and expand its use through innovative value addition, targeting smallholder farmers across 10 districts in the Eastern (Gatsibo, Kayonza and Bugesera Districts), Western (Rusizi and Nyamasheke Districts), and Southern (Kamonyi, Muhanga, Ruhango, Nyanza and Gisagara Districts) Provinces. By promoting sustainable agronomic practices, enhancing post-harvest handling, and fostering an enabling environment for value-chain development, the project aims to strengthen food security and create economic opportunities, particularly for women and youth. National stakeholders – including RAB and RICA – are actively involved. IITA co-leads the post-harvest and value-addition component, scaling quality-enhancing innovations such as high-quality cassava flour (HQCF) for bakery and high-quality cassava peels (HQCP) for livestock, while also building capacities and market links among cassava processors, cooperatives, and consumers.

Achievements

47 bakers

Capacity building for bakers: 47 bakers (32 men and 15 women) were trained and equipped with technical knowledge on incorporating high-quality cassava flour (HQCF) into a range of bakery products including bread, doughnuts, cakes, and chapatis. The training enhanced their skills in product diversification, promoted the use of locally sourced cassava flour, and contributed to increased demand for cassava-based products.

135 trained members

Trained 135 members of five cassava cooperatives in HQCF production. Nearly two-thirds (60%) of the trainees were women.

35 cassava value chain actors

Equipped 35 cassava value chain actors with technical skills in producing high-quality cassava peels (HQCP), thereby enhancing prospects for animal-feed markets.

151 farmers and processors

Up to 151 farmers and processors (88 men and 63 women) were trained in harvesting, packaging, transportation, and storage, improving post-harvest handling and extending cassava shelf-life, strengthened awareness on hygiene, food safety, and processing standards.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor:

Funded by
the European Union

1.3 GREAT LAKES ACCELERATED INNOVATION DELIVERY INITIATIVE RAPID DELIVERY HUB (AID-I GLR) PROJECT

Period: 2023–2026

Goal:
Contribute to improving food and nutrition security in the Great Lakes region through the rapid adoption – at scale – of proven technologies and innovations developed mainly by CGIAR and partners.

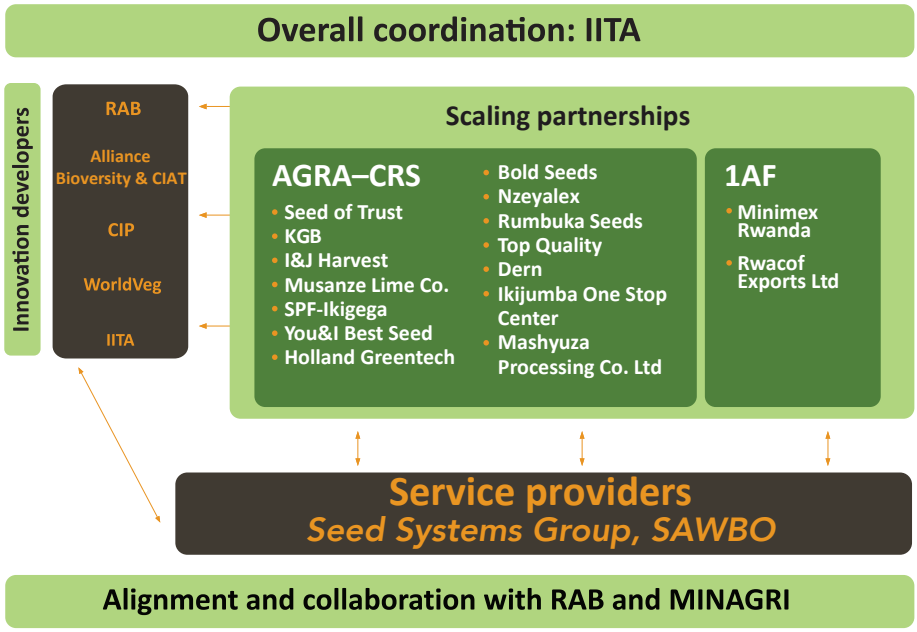
Overview

AID-I GLR brings together multiple partners to alleviate the global food and agricultural input supply shock caused by the COVID-19 pandemic and the Russia–Ukraine war, through the delivery and dissemination of agricultural, nutritional, and livestock innovations in high demand by farmers across Burundi, Democratic Republic of Congo and Rwanda.

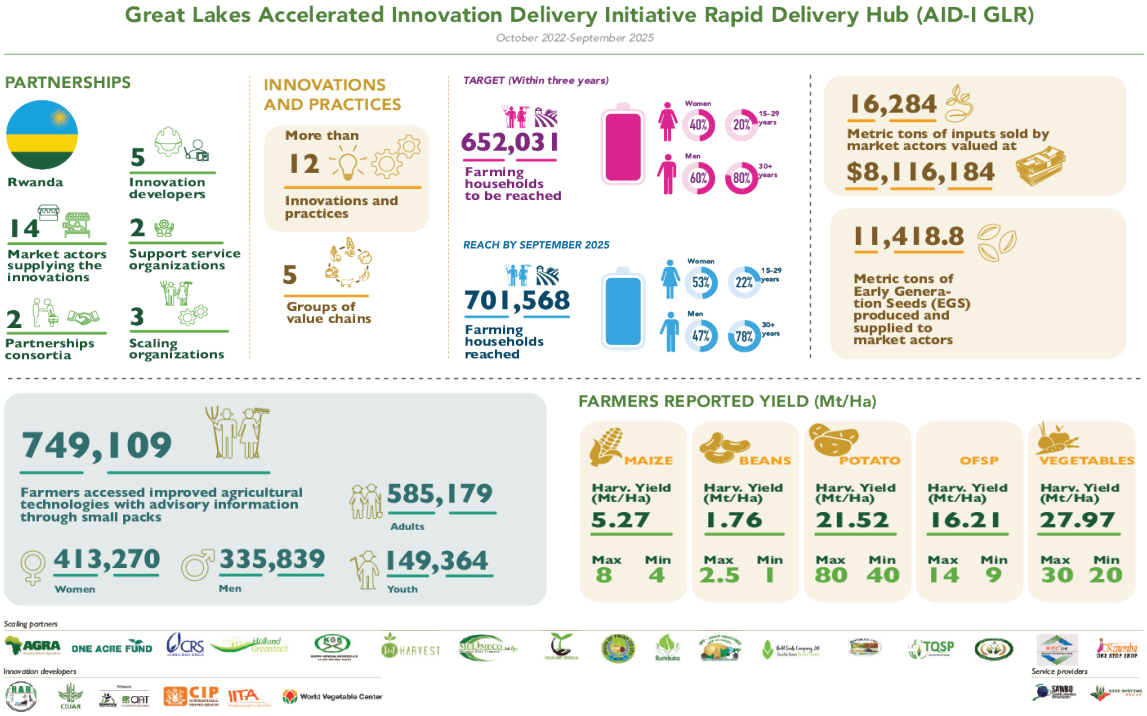
The project connects market actors, agricultural input suppliers, and agro-dealers to disseminate agricultural inputs and best practices to farmers. With AID-I GLR support and facilitation, these actors establish demonstration plots, which serve as farming models for various food-security crops – mainly beans, maize, orange-fleshed sweet potatoes, Irish potatoes, and vegetables – using the best agronomic technologies such as appropriate fertilizer, spacing, planting in lines and many more. Farmer demonstration plots inspire other farmers to adopt similar practices to increase crop yield and quality.

In Rwanda, AID-I GLR has facilitated two partnerships led by AGRA and One Acre Fund, to deliver technologies and innovations to farming households, with technical assistance from CGIAR centers and service providers, and in alignment and collaboration with RAB, and MINAGRI.

Key partners in Rwanda



Achievements



Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor: USAID FROM THE AMERICAN PEOPLE

1.4 1000FARMS PROJECT: UPSCALING AND UPGRADING ON-FARM TESTING OF NEW CROP VARIETIES TO BOOST THEIR IMPACT

Period: 2021–2025

Goal:
Improve and expand on-farm trial solutions to enhance genetic gains and sustainability in agriculture.

Overview

The 1000Farms Project is a collaborative initiative aimed at enhancing on-farm testing of new crop varieties across Africa. It is implemented by the Alliance of Bioversity International and CIAT, IITA, the International Maize and Wheat Improvement Center (CIMMYT), and Wageningen University & Research (WUR).

1000Farms is a continental initiative designed to improve the effectiveness of crop-breeding programs across Africa by generating robust, farmer-driven, on-farm performance data. At its core, the project uses the Triadic Comparison of Technology Options (Tricot), a citizen-science approach that enables farmers to test and evaluate three crop varieties on their own farms. This method captures both agronomic performance and farmer preferences, making the breeding process more participatory and responsive to real-world conditions.

To support this approach, the project integrates the use of ClimMob, a digital platform that facilitates the design, management, and analysis of large-scale, decentralized, on-farm trials. Through ClimMob and mobile-based tools, 1000Farms standardizes and expands data-collection methods, including digital phenotyping and image analysis. These tools allow for efficient real-time data capture across diverse environments and farming systems.

In parallel, the project develops and deploys advanced analytical tools to assess genotype-by-environment-by-management (G × E × M) interactions. This enhances the accuracy and usefulness of variety performance data, which is then used to generate standardized reports that inform breeding decisions, variety release processes, and seed system development.

The project also provides technical support and capacity building for CGIAR centers and national agricultural research systems (NARES), enabling effective implementation of trials and strengthening local capabilities. In addition, it is laying the groundwork for multi-crop and on-farm trial networks to foster broader adoption and efficiency testing across regions.

Achievements in Rwanda

18 districts

One Acre Fund has integrated the Tricot approach into its variety selection research within its seed distribution programs across 18 districts of Rwanda.

5000 farmers

Enhanced farmer participation: the project successfully engaged more than 5000 farmers across the country in testing and evaluating new and improved crop varieties, thus increasing their adoption.

20 researchers

Capacity building: conducted training programs to build the capacity of 20 researchers and 22 extension agents in implementing Tricot and utilizing the ClimMob platform.

Policy influence: provided evidence-based insights that have informed policy decisions related to variety release and seed system development.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor: Gates Foundation

1.6 CASSAVA AGRIBUSINESS SEED SYSTEMS (CASS) PROJECT: DESIGNING AND TESTING CASSAVA AGRIBUSINESS MODELS

Period: 2019–2021

Goal:
Enabling agribusiness development for scaling quality cassava seed systems for control of major viral diseases in Rwanda and Burundi.

Overview

The CASS Project operated in Rwanda and Burundi, to enable agribusiness development for scaling quality cassava seed systems to control major viral diseases (CBSD and CMD). The project's overall objective was to select a diversity of CBSD- and CMD-resistant cassava clones, responding to farmer demand and preferences. The next steps were to certify this material for quality assurance, make it available through different agribusiness models, and to upscale these models in Rwanda and Burundi.

IITA collaborated with SPARK (an NGO focusing on nurturing business among the youth and women in Rwanda and Burundi), WUR, RAB, and the Institut des Sciences Agronomiques du Burundi (ISABU) to produce and distribute improved cassava varieties with strong CBSD and CMD resistance, evaluated for diverse end-user preferences in Rwanda and Burundi.

Achievements

Partnerships: CASS collaborated with local and community-based organizations in the implementation of activities to ensure local ownership. It forged three partnerships with community-based organizations (INGABO syndicate, Rwanda Youth in Agriculture Forum (RYAF), the Rwanda Seed Multipliers Organization (RWASMO), and the national network of seed multipliers for cassava seed systems, resulting in initiating the commercial multiplication of quality basic seed for cassava.

Capacity development: Two basic seed centers were initiated with private seed entrepreneurs in Rwanda.

CASS business models: After an assessment of existing CASS models, the markets and other seed value chain actors, three business models were recommended for Rwanda for testing in other interventions.

A semi-autotrophic hydroponics (SAH) laboratory was installed in Rwanda to increase multiplication rates of cassava pre-basic seeds.

470
leaf samples

DNA fingerprinting of locally grown varieties: a total of 376 and 470 leaf samples of local and improved cassava varieties already grown in Rwanda were collected for DNA fingerprinting to document and map as a baseline for improved varieties.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor:

Government of the Netherlands

Netherlands Organisation for Scientific Research

1.7 CONSORTIUM FOR IMPROVING AGRICULTURE-BASED LIVELIHOODS IN CENTRAL AFRICA (CIALCA)

Period: 2006–2021

Goal:
To accelerate the impact of agricultural research for sustainable development and transformation and improving the livelihoods of farming households in Central Africa through partnerships, capacity building, and inclusive innovations.

Overview

CIALCA was initiated in 2006 as a response to the need for a coordinated research approach to address challenges in agriculture-based livelihoods across the Great Lakes Region (Burundi, eastern Democratic Republic of Congo and Rwanda). It emerged from the integration of three complementary CGIAR projects, supported by the Belgian Directorate General for Development Cooperation (DGDC).

Over a span of 15 years, CIALCA evolved through four main phases, adapting its vision, research priorities, and innovation approaches. It transformed from a technology-testing initiative to a platform for integrated systems research, capacity development, and policy engagement. CIALCA played a pioneering role in aligning regional agricultural research with global development goals, contributing significantly to CGIAR's shift toward One CGIAR and integrated regional initiatives.

In Rwanda, CIALCA worked closely with RAB, the University of Rwanda, NGOs, private-sector actors, IITA, and other CGIAR centers such as the Alliance of Bioversity and CIAT.

Rwanda played a strategic role throughout CIALCA's lifespan, serving as a key hub for piloting innovations, building scientific capacity, and fostering south–south collaboration in agricultural research and development.

Achievements

USD
10.9
million value of partnerships

Partnerships and policies

- Partnered with RAB, One Acre Fund, and other national actors to co-develop and scale agricultural innovations.
- Mobilized multi-year co-investment partnerships valued at over USD 10.9 million, more than 3.6 times the original investment.
- Engaged in policy dialogue and contributed to national strategies on agriculture, nutrition, and innovation.

Capacity development

- Sponsored the training of 12 PhD and 17 MSc Rwandan students across agricultural research themes.
- Trained 70+ RAB extension officers on using digital tools for banana pest and disease management.
- Supported curriculum development and provided regional research exchanges, creating a strong alumni network of researchers and practitioners.

Inclusive innovation

- Developed and disseminated 30 tailored innovations including improved cassava–legume systems, banana pest management tools, and ICT-based advisory services.
- Emphasized participatory research, citizen science, and co-development of technologies.
- Promoted gender-sensitive and nutrition-sensitive agricultural systems research.

110+
peer-reviewed publications

Knowledge ecosystem impact

- Contributed to 110+ peer-reviewed publications, with Rwanda-based researchers actively involved in 25% of these outputs.
- Supported regional knowledge exchange and inspired initiatives like the African Cassava Agronomy Initiative and the Excellence in Agronomy platform.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donors:

KINGDOM OF BELGIUM
Federal Public Service
Foreign Affairs,
Foreign Trade and
Development Cooperation

CGIAR

1.8 CASSAVA BROWN STREAK DISEASE CONTROL PROJECT: FIGHTING CBSD AND CMD THROUGH DEPLOYMENT OF NEW RESISTANT CASSAVA GERMPLASM AND CLEAN SEED IN RWANDA AND BURUNDI

Period: 2017–2020

Goal:
Increase cassava productivity in Burundi and Rwanda through development and deployment of CBSD- and CMD-resistant varieties, as well as a system that will produce high-quality virus-tested seed and facilitate its dissemination to farmers.

Overview

The CBSD project was a direct response to the national outcry over declining cassava productivity due to the CBSD outbreak in Rwanda. Between 2014 and 2016, the devastating effects of CBSD became apparent in Rwanda, with no available resistant or tolerant varieties. The CMD-resistant varieties released earlier succumbed to CBSD, imperiling food security and incomes. Rwanda's Kinazi Cassava Plant was almost closed since there were no roots to process due to a CBSD-driven productivity decline. There was a general lack of resistant varieties, exacerbated by informal seed systems where farmers shared and used infected stem cuttings from the previous season.
To address these challenges, the project implemented a dual strategy: a) developing and deploying improved CBSD- and CMD- resistant varieties, and b) establishing clean seed systems for cassava to mitigate the effects of CBSD and CMD.

Achievements

Variety development and deployment

- 17 elite clones introduced and tested in Rwanda.
- 72,621 true seeds introduced in Rwanda from IITA cassava breeding platforms in eastern and western Africa.
- 22 cassava accessions cleaned by the Kenya Plant Health Inspectorate Service (KEPHIS) and returned to Rwanda

72,621 true seeds introduced in Rwanda

17 elite clones introduced

22 cassava accessions cleaned

Establish clean seed systems

- Policy frameworks for cassava seed quality regulation were reviewed, resulting in the launching of cassava clean seed standards by the Rwanda Standards Board (RSB).
- Systems for pre-basic and basic seed multiplication were built for improved techniques for high macro-propagation rates.
- Seed inspection and certification were implemented, and national seed inspectors trained on cassava seed inspection and certification.

Building capacities of key stakeholders

- The project sponsored an MSc student, working at RAB, who successfully completed her studies in 2021.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor:

IFAD
Investing in rural people

1.9 N2AFRICA: PUTTING NITROGEN FIXATION TO WORK FOR SMALLHOLDER FARMERS IN AFRICA

Period: Phase I (2009–2013); Phase II (2014–2019)

Goal:
Enhance biological nitrogen fixation (BNF) through the cultivation of legumes (primarily soybeans, climbing beans, and bush beans), by smallholder farmers to improve soil fertility, household nutrition, and income generation.

Overview

Legumes bring atmospheric nitrogen into the crops and the soil through a symbiosis with rhizobium bacteria. They are also an important source of protein for a healthy diet. Enhanced productivity of legumes therefore contributes to enhanced soil fertility, household nutrition and income. N2Africa enabled smallholder farmers in Africa to reap these benefits through the implementation of effective production technologies, including inoculants and fertilizers. The project was implemented in 11 African countries, including Rwanda.

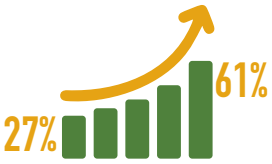
In Rwanda, N2Africa focused on strengthening the legume value chain through integrated agronomic innovations and inclusive partnerships. It covered multiple districts in the Eastern, Southern, Northern, and Western Provinces, including Bugesera, Kayonza, Kamonyi, Musanze, Gakenke, Burera, and Ngororero Districts. Key interventions included the distribution of legume input packages (quality seeds, phosphorus fertilizer, and inoculants), the establishment of demonstration plots, capacity building, support for women and youth groups, and engagement with agro-dealers.

Achievements

By 2019, N2Africa had:

6 high yielding varieties tested and released

Tested and released six new high-yielding and input-responsive soybean varieties namely SC Saga, SC Squire, SB 24, SB 8, PK6 (an improved local variety) and Sequel.



soybean cultivation Raised from 27%-61%

Raised soybean cultivation uptake to 61% among supported farmers, compared to 27% among non-recipients.

Production of **2,006** packages of inoculants for beans and **32,158** packages of inoculants for soybeans

RAB produced more than 2,006 packages of inoculants for beans and 32,158 packages of inoculants for soybeans .

Seed Co – a Pan-African seed company that develops seeds for crops like maize, wheat, sorghum, rice, and soybeans – opened a business unit in Rwanda in January 2013. The company played a key role in developing the soybean sub-sector in the country (facilitated release and commercialization of the newly introduced soybean varieties: Saga, Sequel, and Squire).

8,780 packets in 2012

The RAB microbiology laboratory at Rubona received additional equipment for inoculant production (a big fermenter, autoclave, a reciprocating shaker, and grinder). This increased inoculants production 40-fold, from producing 222 packets of 80 grams in mid-2010 to more than 8,780 packets at the end of 2012.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor: Gates Foundation

2. STRENGTHENING AGRICULTURE EXTENSION AND ADVISORY SERVICES

IITA in Rwanda strengthens agricultural extension services by training farmers and extension agents in climate-smart practices and improved agronomic practices. It promotes digital tools to deliver real-time farming advisories. Partnering with government and development partners, IITA ensures inclusive, gender-responsive extension support to enhance food security and resilience for smallholder farmers across Rwanda.

2.1 RWANDA SOIL INFORMATION SYSTEM (RWASIS) PROJECT

Period: 2020–2022

Goal:
Establish a modern Soil Information System for Rwanda (RwaSIS) to improve soil fertility management, optimize agricultural productivity, and guide sustainable land-use decisions.

Overview

The Rwanda Soil Information Service (RwaSIS) project is a groundbreaking initiative led by RAB in collaboration with IITA. The project responded to a critical need to address long-standing challenges related to declining soil fertility, acidic soils, and erosion across Rwanda's diverse agroecological zones. These challenges have limited the effectiveness of existing fertilizer and lime use under the Crop Intensification Programme.

By leveraging advanced geoscience technologies like digital soil mapping, remote sensing, geostatistics and soil spectroscopy, RwaSIS developed localized fertilizer and lime recommendations tailored to Rwanda's diverse soils and cropping systems. These insights were generated through extensive soil sampling, fertility mapping, and large-scale field trials across six priority crops – beans, cassava, maize, wheat, potatoes, and rice – alongside erosion risk assessments to guide sustainable land management.

Achievements

RwaSIS tool: created a modern, interactive digital soil information system embedded within the national data infrastructure and built on FAIR (findable, accessible, interoperable, and reusable) data principles.

Integration of recommendations into SNS (the national agricultural subsidy system).

Established the **national soil spectroscopy laboratory** and trained Rwandan experts on it.

5,750
soil samples collected

Fertilizer and lime trials: 839 research trials established; over 5,750 soil samples collected and analyzed; predictive fertility maps developed for 15 key parameters.

Erosion risk mapping: national-scale erosion risk assessments completed; spatial investment plans created to guide erosion control measures.

National Soil Information System: fully equipped soil spectroscopy laboratory operational; data governance protocols finalized; digital system architecture ready for national integration.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor: Gates Foundation

2.2 Scaling Fund Project: Excellence in Agronomy for sustainable intensification and climate change adaptation (EiA) – Rwanda use case

Period: 2022–2030

Goal:
Enhance agricultural productivity, efficiency, and climate resilience in Rwanda by successfully scaling the adoption of site-specific fertilizer recommendations through the Smart Nkunganire System (SNS).

Overview

Rwanda's agricultural sector faces critical productivity challenges due to severe land constraints, with 85% of rural households farming less than one hectare, combined with suboptimal crop- and nutrient-management practices that significantly limit yields. While the Government of Rwanda's Crop Intensification Programme launched in 2007 has achieved notable production increases through land consolidation and improved inputs, the current fertilizer subsidy scheme relies on uniform, blanket recommendations that fail to account for Rwanda's diverse agroecological conditions. This one-size-fits-all approach results in inefficient fertilizer use, suboptimal crop responses, and reduced profitability for farmers, despite substantial government investment in agricultural inputs.

Building on successful pilot studies conducted between 2020 and 2022 by CGIAR (the International Potato Center and IITA) and RAB, this project leverages the comprehensive Rwanda Soil Information System (RwaSIS) to develop site-specific fertilizer recommendations for six priority crops, namely beans, cassava, maize, wheat, potatoes, and rice. The initiative utilizes advanced crop models, machine learning algorithms, and extensive multi-location trial data to generate precision agriculture recommendations through the Excellence in Agronomy (EiA) AgWISE platform.

As a result of massive digitization drive by the Government of Rwanda, the digitization of the agro-input supply chain and subsidy scheme through the Smart Nkunganire System (SNS), developed by BKTechouse and RAB, has enabled Rwanda to establish a robust platform with more than 1.5 million registered users. Therefore, the integration of advisory services such as the Fertilizer Recommendation Tool into SNS is envisioned as a key strategy for delivering site-specific fertilizer recommendations to farmers at scale, thereby enhancing agricultural productivity and sustainability across the country.

Achievements

Innovation packaging: identifying barriers and enablers to scale through Innovation Packaging and Scaling Readiness (IPSR).

Workstream development: Five workstreams were derived from the IPSR workshop and served as a guide for data gathering during the development of the scaling strategy.

Partnership building: High-level engagement with key stakeholders to address the identified bottlenecks, including RAB management, RAB Agricultural Inputs Subsidies unit, BKTechouse, Imbaraga, MEDA, and One Acre Fund, which resulted in a commitment to support the development of the scaling strategy and the innovation scaling phase.

Interdisciplinary collaboration: A collaboration with the EiA Monitoring, Evaluation, Learning and Impact Analysis (MELIA) team was established, which resulted in joint efforts in piloting the fertilizer recommendations. Furthermore, a joint write-shop was conducted in collaboration with CGIAR centres, RAB, EiA and Ukama Ustawi

Capacity building across partnerships: the project strengthened capacity by updating and distributing the SNS curriculum nationwide, training 67 master trainers and 100 farmer promoters who cascaded knowledge to 7,500 farmers. The project also produced 4,000 Kinyarwanda leaflets on good agricultural practices and fertilizer recommendations.

The scaling strategy: A completed draft scaling strategy outlining a clear roadmap for expanding the reach of the SNS-Fertiliser Recommendation Tool across Rwanda.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor:

CGIAR

2.3 CITIZEN SCIENCE AND ICT FOR ADVANCING THE PREVENTION AND CONTROL OF BANANA XANTHOMONAS WILT (BXW) IN EAST AND CENTRAL AFRICA (ICT4BXW PROJECT)

Period: 2018–2023

Goal:
Leverage digital tools and citizen science to monitor, prevent, and control banana xanthomonas wilt (BXW) disease in Rwanda, thereby boosting banana production and enhancing the livelihoods of smallholder farmers

Overview

Bananas are a staple crop in Rwanda, occupying approximately 25% of arable land and serving as a crucial source of food and income for millions of smallholder farmers. However, the spread of BXW has posed a significant threat to banana production, leading to substantial yield losses.

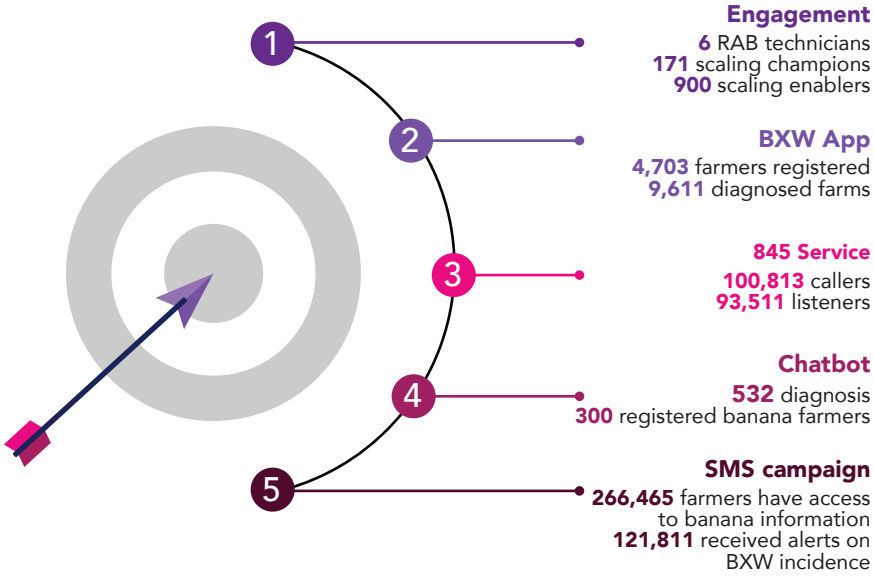
In response, the ICT4BXW project was initiated in 2018 as a collaborative effort between IITA, RAB, Alliance of Bioversity International and CIAT, the Leibniz Institute of Agricultural Development in Transition Economies (IAMO), and WUR, with funding from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

The project focused on developing and deploying digital and non-digital tools. These included remote training, the BXW App, Chatbot, SMS campaign, and the 845-service. This service is a digital system that provides banana agronomic advices for farmers through 8-4-5 service platform (*845# or dial 845_yes). Any farmer, phone type notwithstanding, can dial 845_yes and *845# and follow the steps that provide agronomic information on best banana agronomy. Service development and deployment were monitored through a surveillance dashboard by the national agriculture system. The idea was to empower farmers and extension agents with real-time information and decision-support systems for effective BXW management.

The digital tools developed are accessible on both feature phones and smartphones. Non-digital tools such as booklets, posters and brochures were distributed across the country to provide banana agronomic information and increase production.

Achievements

Project Achievements (2018 – 2023)



Contribution to the United Nations Sustainable Development Goals (SDGs)

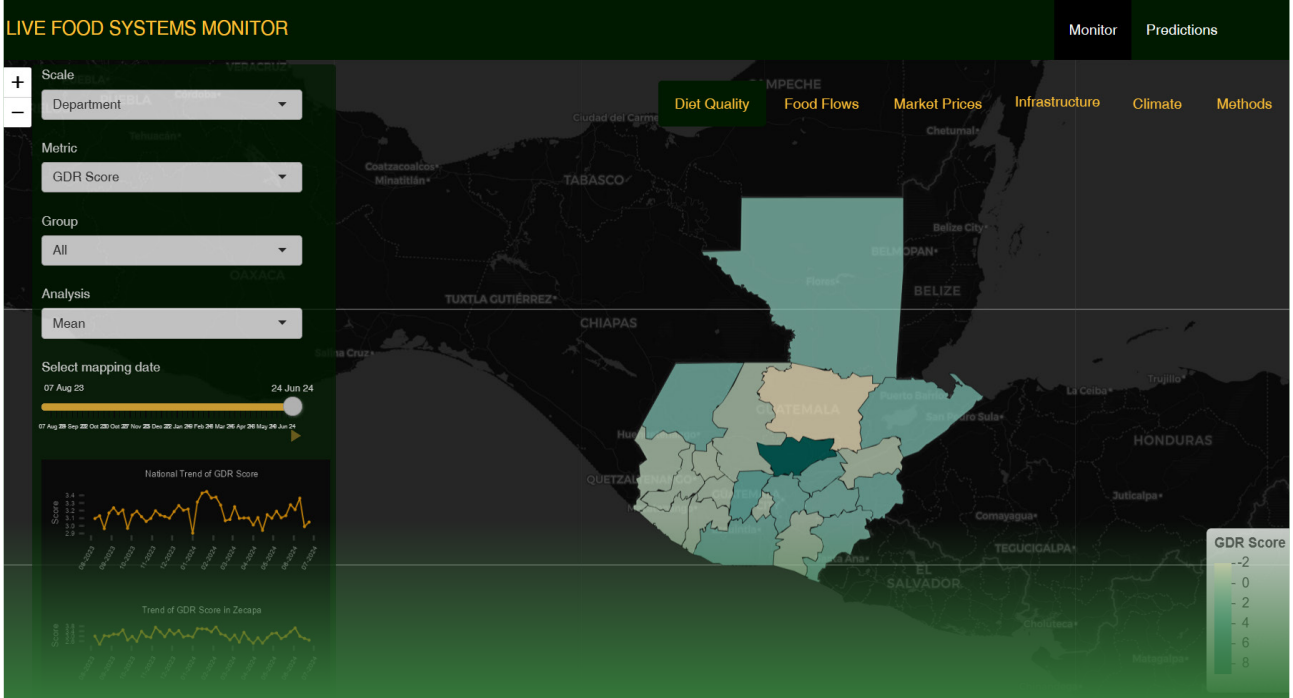
Donor:

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Federal Ministry for Economic Cooperation and Development

3. PROMOTING FOOD SAFETY, HEALTHY DIETS, AND NUTRITION-SENSITIVE AGRICULTURE

Healthy diets and nutrition are fundamental pillars of sustainable households. Rwanda has made significant progress in improving nutrition through collaborative efforts with partners. However, challenges persist, as evidenced by high rates of stunting and malnutrition, particularly among children under five. IITA, alongside other CGIAR centers, is contributing to addressing these challenges through innovative solutions, leveraging digital tools and food-safety technologies, strengthening food security, and promoting nutrition-sensitive interventions across the country.



3.1 LIVE FOOD SYSTEM MONITOR PROJECT: HIGH-FREQUENCY CROWDSOURCING OF FOOD-SYSTEM DATA

Period: 2023–2024

Goal:
Quantify the impact of the Ukraine crisis on dietary choices, consumption, and malnutrition by tracking diet quality and healthy diet prices in Rwanda and comparing them with pre-crisis data.

Overview

The Live Food System Monitor (LFSM) is a digital innovation designed to strengthen the resilience of food systems by collecting and analyzing high-frequency data across Rwanda, Nigeria, and Guatemala. It integrated existing data systems and leveraged MeMo – the data-collection and integration platform – to gather timely information on diet quality, market activities, transportation networks, and climate conditions. Using channels like Unstructured Supplementary Service Data (USSD), interactive voice response (IVR), WhatsApp, and Telegram, LFSM ensured inclusive and context-sensitive data collection. This system enables stakeholders to monitor food-system performance in near real-time and identify early warning signs of disruption, thereby supporting timely and evidence-based interventions.

In Rwanda, LFSM was piloted from September 2023, collecting monthly data from 8,000 individuals and 500 food vendors. The insights are fed into an interactive dashboard, where descriptive analytics were already available, with predictive and prescriptive tools. By combining crowd-sourced and structured data, LFSM aimed to inform decision-making by government, civil society, and funders. The ultimate goal was to enhance preparedness, policy design, and risk management in the face of evolving food-system challenges.

Achievements

8,000 diet-quality responses

Successfully piloted in Rwanda, with continuous monthly collection of 8,000 diet-quality responses and 500 market-vendor surveys.

Integrated real-time data across multiple domains (markets, climate, diet, and transportation).

Developed a publicly accessible dashboard for visualizing food-system dynamics.

Enabled early identification of threats to food access, affordability, and availability.

Demonstrated the feasibility of using digital platforms for high-frequency food-system monitoring in lower middle-income countries.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor:

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3.2. AFLASAFE RW01: BIOCONTROL INNOVATION FOR FOOD SAFETY IN RWANDA

Period: 2020–2024

Goal:
To develop and deploy Aflasafe RW01, a revolutionary biocontrol product using native Rwandan atoxigenic Aspergillus flavus strains to significantly reduce aflatoxin contamination in maize, thereby enhancing food safety, improving market access, and protecting public health across Rwanda.

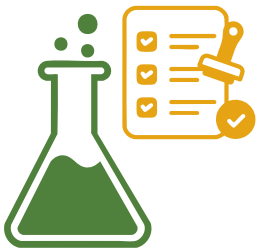
Overview

The Aflasafe RW01 project represents a groundbreaking partnership between IITA, RAB, and the United States Department of Agriculture – Agricultural Research Service (USDA–ARS) to combat one of Africa's most persistent and widespread – and yet largely invisible and therefore unknown – agricultural challenges: aflatoxin contamination in food. This innovative initiative harnesses the power of nature itself, utilizing four distinct, native, Rwandan, non-toxic Aspergillus flavus (A. flavus) isolates (RWM135-10, RWM08-6, RWM144-1, and RWM14-1). The isolates were sourced from diverse districts including Kamonyi, Musanze, and Ruhango. A. flavus is a soil fungus.

Unlike conventional chemical treatments, Aflasafe RW01 employs a biocontrol approach that is environmentally sustainable, farmer-friendly, and uniquely adapted to Rwanda's agricultural ecosystem. The product works by introducing beneficial, non-toxin-producing fungi that naturally outcompete harmful aflatoxin-producing types, thereby providing protection both in the field and during post-harvest storage.

Through rigorous scientific development funded by AGRA funding and supported by collaborative research initiatives, the project has systematically tested efficacy (ability to produce desired results) across multiple agroecological zones, engaged with local manufacturers like Africa Improved Foods (AIF) and MINIMEX (a leading Rwandan agribusiness company known mainly for maize flour and other cereal processing), and developed comprehensive commercialization strategies in partnership with Dalberg Research.

Achievements



Scientific excellence and efficacy validation

- Successfully identified and characterized four unique vegetative compatibility groups of atoxigenic A. flavus strains exclusive to Rwanda.
- Comprehensive efficacy trials across two seasons (2021A, 2022A) in strategically selected districts including Nyagatare, Bugesera, Kayonza, Rwamagana, and Gisagara, demonstrated consistent and significant protection against aflatoxin contamination under normal field conditions. The levels of aflatoxin in all the Aflasafe RW01 treated maize were below the East African Community's regulatory limits (less than10 parts per billion). In contrast, 16.7%, 9%, and 6.7% of the untreated samples collected from Nyagatare, Ngoma, and Rwamagana, respectively, did not meet the aflatoxin-safety standards.

Regulatory milestone achievement

- Successfully obtained temporary registration from the Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA) in October 2022.
- Achieved regulatory approval with an initial six-month validity period (July 2023–January 2024). The final registration is underway.

production model with **2.5** mt/day plant capacity

Market development and commercial viability

- Developed a comprehensive commercialization strategy projecting market demand and manufacturing feasibility.
- Designed scalable production model with 2.5 mt/day plant capacity (625 mt annually) to serve both domestic and regional markets.

Contribution to the United Nations Sustainable Development Goals (SDGs)

Donor: USAID FROM THE AMERICAN PEOPLE

4. DEVELOPING AND DISSEMINATING AGROECOLOGY AND CIRCULAR-ECONOMY INNOVATIONS

IITA in Rwanda promotes agroecology and circular-economy innovations to build more resilient and sustainable food systems. By encouraging climate-smart practices, recycling agricultural and household waste into valuable resources, and fostering inclusive business models, these efforts improve soil health, reduce reliance on external inputs, and create new livelihood opportunities for farming communities, particularly women and youth.

4.1 RURAL –URBAN NEXUS: ESTABLISHING A NUTRIENT LOOP TO IMPROVE CITY REGION FOOD SYSTEM RESILIENCE (RUNRES) PROJECT

Period: 2019–2027

Goal:
To contribute to improved livelihoods, food security and environmental and human health in city region food systems through the implementation and scaling of innovations for circular food value chains.

Overview

The RUNRES Project is a pioneering initiative led by ETH Zurich in the Democratic Republic of Congo, Ethiopia, Rwanda and South Africa. In Rwanda, the project is coordinated by IITA and implemented in Kamonyi District, with a strong focus on the cassava value chain.

RUNRES Rwanda aims to close the loop between rural production and urban consumption by transforming organic waste such as cassava peels, market waste, and household residue into productive resources like organic compost and animal feed. The project takes a systems approach by engaging municipalities, farmers, private-sector actors, and researchers in the co-creation of scalable waste-to-resource innovations. Through this collaborative model, RUNRES contributes to improved soil health, reduced dependence on imported fertilizers, cleaner urban environments, and increased income opportunities, especially for women and youth.

Achievements

Established waste-to-value enterprises: RUNRES has supported 8 small businesses scaling the circular economy innovations, which uses black soldier fly larvae to process organic waste into protein-rich animal feed, and Akanoze Nyamiyaga Ltd, which processes cassava peels into commercial livestock feed.

Promoted circular solutions for smallholder farmers: farmers have benefited from access to affordable organic compost and feed products derived from agricultural and household waste.

Local government engagement: Strong collaboration with the Kamonyi District authorities has enabled integration of project innovations into local development strategies, thus conferring ownership and enhancing sustainability.

Capacity building: 200+ stakeholders, including entrepreneurs, farmers, and local government officials, have received training in circular economy approaches and sustainable waste management.

Contribution to the United Nations Sustainable Development Goals (SDGs)

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4.2 DRIVING AGROECOLOGICAL TRANSITIONS IN THE HUMID TROPICS OF CENTRAL AND EASTERN AFRICA THROUGH TRANSDISCIPLINARY AGROECOLOGY LIVING LABS (CANALLS) PROJECT

Period: 2023–2026

Goal:
To drive agroecological transitions in the humid tropics of Central and Eastern Africa by establishing multi-actor, transdisciplinary Agroecology Living Labs (ALLs) that co-create sustainable agricultural practices, with a focus on enhancing food security, environmental sustainability, and socio-economic resilience.

Overview

CANALLS is a comprehensive initiative driving agroecological transitions in the humid tropics of Central and Eastern Africa through transdisciplinary agroecology living labs. The initiative aims at catalyzing sustainable agricultural practices in the region. By leveraging multi-actor transdisciplinary Agroecology Living Labs (ALLs), the project seeks to address the challenges within local food systems by providing holistic agroecological solutions tailored to the unique conditions of the area.

ALLs are designated areas selected under the CANALLS project to host trials in which agroecological farming practices are tested by farmers themselves.

The objectives of the project encompass establishing ALLs that engage various stakeholder communities to collaboratively identify and co-create conditions and tools necessary to support agroecological transitions. This involves the co-development of practical tools tailored to the humid tropics of Africa, thus enabling the assessment of socio-economic and environmental impacts of agroecological practices. Additionally, the project aims to co-design services and marketing tools to stimulate demand for agroecological food products, thereby ensuring fair value propositions and sustainable business models that facilitate access to markets.

CANALLS also co-creates, tests, and evaluates agroecological strategies specifically suited to the challenges of the humid tropics, addressing complex socio-economic and environmental aspects in food systems. Lastly, the project endeavors to support and build capacity for the adoption of agroecological practices through knowledge exchange, policy dialogues, and collaboration with key networks for dissemination, utilization, and replication.

Achievements

Establishment of the Kamonyi Agroecology Living Lab: a collaborative platform bringing together 1,000+ farmers, researchers, and extension workers to co-develop agroecological practices.

Capacity building: training sessions and workshops conducted to enhance stakeholders' knowledge and skills in sustainable agriculture and agroecology.

Development of decision-support tools: creation and dissemination of tools to assist farmers and advisors in selecting appropriate agroecological practices based on local conditions.

Market-access initiatives: co-designing fair and inclusive business models that facilitate access to markets for agroecologically produced goods.

Policy engagement: active dialogues with policymakers to integrate agroecological approaches into national agricultural strategies and policies.

Contribution to the United Nations Sustainable Development Goals (SDGs)

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