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How Integration Enhances the Competitiveness of Agribusinesses and Smallholder Farming Systems

THE TANZANIA CASE STUDY

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Foreword

Prof Adolf F. Mkenda (MP)

Minister for Agriculture, The United Republic of Tanzania

Agriculture is central to the economy of Tanzania and a source of livelihood for approximately 65% of the population. This sector contributes about 27% to the country's GDP and accounts for 24% of total exports. Given the structure of the Tanzanian economy, there is no doubt that agricultural growth is directly linked to economic prosperity and poverty reduction. According to the Third National Five-Year Development Plan 2021/22–2025/26, the Government of Tanzania has resolved to consolidate and further scale up the achievements so far recorded, and to explore new opportunities to drive the competitiveness of the agricultural sector. We will continue to:

a) Focus on value addition and strong forward and backward linkages between agriculture and other sectors of the national economy.

b) Create a favorable environment for the private sector to engage profitably in the production, processing and export of agricultural commodities.

c) Strengthen training and research programs to benefit key stakeholders, including youth, women, and people with disabilities.

d) Integrate domestic production within regional and continental supply chains to increase employment creation, as well as expand the diversification of agricultural products and services.

The growth of the agriculture sector requires the use of improved technologies to increase productivity, reduce post-harvest losses, and to create opportunities for sustainable commercialization of crop value chains. The proper use of research and technologies will increase yields, reduce food prices and risks, and increase profits, thus improving the livelihoods of the citizens. To increase productivity and efficiency in the sector, the government will focus on the following value chains: maize, rice, cotton, cashew nut, tea, coffee, tobacco, sisal, palm, wheat, soybean, cocoa, cassava, sugarcane, horticulture, and sunflower. Planned interventions include: (i) enhancing research and

development in strategic crops; (ii) expanding sustainable water and land use management through integrated land use planning and improvement of irrigation systems, including the construction of water reservoirs; (iii) enhancing productivity in strategic crops; (iv) strengthening the competitiveness of crop value chains and commercialization; (v) encouraging the use of ICT in the operations of cooperatives, commercial agriculture and provision of extension services; and (vi) introducing modern crop management systems.

During the last 14 years, AGRA's investments in Tanzania have covered a wide range of interventions aligned to the sector priorities outlined above. These include developing and releasing improved crop varieties, training scientists and enhancing research infrastructure, establishing local seed companies, strengthening the extension system, linking smallholder farmers to markets and finances, introducing and popularizing hermetic solutions to reduce post-harvest losses, developing agro-dealers, and working with the government to improve sector coordination and put in place a favorable environment for private sector growth. These investments focused on building key systems, partnerships, and integrated agribusiness consortia. AGRA also mobilized actors to address bottlenecks in key thematic areas such as post-harvest management, agricultural finance and policy reforms. To enhance capabilities and sector coordination at the local administration level, AGRA worked with the relevant institutions to support the development of District Agricultural Development Plans (DADPs) in selected regions.

To attain our agricultural development objectives, we must keep monitoring, evaluating and learning from the interventions we implement as a ministry together with our partners. This is an essential cornerstone of performance management and accountability. This book provides an opportunity for all the stakeholders to learn from one another and to provide feedback and accountability on the performance of agricultural investments. This practice ensures that charitable funds are utilized properly, ultimately attaining value for money, accountability, and transparency.

I call upon all agriculture sector partners to borrow a leaf from the example set by AGRA and publish the results of their work in Tanzania. I also encourage all implementing and development partners in the sector in the country to increase their accountability. Let us promote transparency and learn from each other.

GOD BLESS AFRICA, GOD BLESS TANZANIA!

Dr. Agnes Kalibata

President, AGRA

Preface

AGRA adopted an integrated approach following a decade of partnerships with governments, development partners and the private sector to build and strengthen agricultural systems such as seed, fertilizer, soil health, agro-dealership, extension, markets, and agri-finance. Over the last four years, the integrated approach has proved that synergies between systems create more value, leading to the adoption of technologies at scale, while creating sustainable agribusiness relationships, delivery models, and practices.

Tanzania is one of seven countries where AGRA has mobilized enterprises from various agricultural value chains, farmer groups, financial institutions, and other service providers to serve shared inputs and output markets. Traders, off-takers, processors, input companies, and farmer groups came together on the same platform to jointly plan for each agricultural season. The data shared among stakeholders created a comparative advantage through cost reduction and assured input and output markets.

Thus, our AGRA team and the implementing partners provided an integrated suite of services for 756,872 farmers in Tanzania, delivered through agribusiness consortia. As a result, farmers gained better access to markets and inputs through financing arrangements involving off-takers, input companies and financial institutions. As participating farmers improved their practices and production levels, private agribusinesses also increased their investments in crucial infrastructure and supply chains for input and output markets. Every dollar that AGRA invested in facilitating the development and functioning of the agribusiness consortia led to 18 dollars of incremental investment in storage, processing facilities and working capital.

This book narrates Tanzania's experience of the agribusiness consortia approach – facilitating private sector, government, and nonprofit institutions to work together to deliver value to producers and consumers. The experiences and lessons described in this book illustrate the importance of systems and value chain integration and encourage the private sector and the government to work together to enhance predictability in the agricultural marketplace, while scaling up similar investments in many more regions of the country.

Acknowledgements

Prof. Jean Jacques M. Muhinda

Regional Head, East Africa, AGRA

AGRA has been working with African governments and the private sector to build and strengthen agricultural systems. However, to reach the scale required, all these systems must be integrated and provide complimentary goods and services to farmers.

This book and the work presented herein is a result of the implementation of our five-year strategy in Tanzania aimed at improving the food security and income of 1.5 million smallholder farmers. This would not have been possible without goodwill, support and cooperation of the Government of the United Republic Tanzania, technical and development partners, and private sector on whose financial resources, expertise and influence we leveraged to deliver lasting benefits to beneficiary farmers. We would like to especially acknowledge and appreciate the cordial relationship with the Ministry of Agriculture, Ministry of Regional Administration and Local Government Authority, and the Ministry of Trade and Industry.

Our partners under the Partnership for Inclusive Agricultural Transformation in Africa (PIATA) have been the engine behind our integrated delivery model within the agro-economic zones and across value chains. This partnership enabled us to leverage public and private investments to build sustainable systems that will transition agriculture from subsistence into a profitable enterprise. PIATA partners include AGRA, the Bill & Melinda Gates Foundation, the Rockefeller Foundation, the United States Agency for International Development, the UK Foreign, Commonwealth and Development Office, and the German Federal Ministry of Economic Cooperation and Development.

We are also grateful to the Mastercard Foundation for providing direct financial support to AGRA and its programs. The foundation's funding in Tanzania has helped to develop, pilot and roll out innovative and affordable financial and non-financial solutions for smallholder farmers, strategically complementing the agribusiness consortia. Some of these solutions have used digital technology to enhance outreach and reduce the costs of serving farmers.

This Tanzania Case Study, detailing how integration can enhance the competitiveness of agribusinesses and smallholder farming systems, has been written by AGRA employees based in Tanzania and at our headquarters in Nairobi, Kenya. We thank these contributors for their collective effort in developing and producing this book.

We appreciate the support the team received from the AGRA President, Dr. Agnes Kalibata, who authored the preface, and AGRA board members, especially H.E. Dr. Jakaya Kikwete, who have been champions of farmer-centered models.

To all our implementing partners in Tanzania, we are grateful for the work we accomplished together, the legacy we created and the lessons we learned. We are excited about the future. We thank all the people and institutions who provided support in various ways toward the production of this book.

Thank you all.

Acronyms

ACT	Agriculture Council of Tanzania
ADP	Action for Development Programs
AGRA	Alliance for a Green Revolution in Africa
AIF	Africa Improved Foods
AMCOS	Agricultural and Marketing Co-operative Societies
AMDT	Agricultural Markets Development Trust
ANSAF	Agriculture Non-State Actors Forum
ASDP	Agricultural Sector Development Program
ASLM	Agriculture Sector Line Ministries
AU	African Union
AVISA	Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa
B2B	Business to Business
BDS	Business Development Service
BEST	Building an Economically Sustainable Tanzania
BRiTEN	Building Rural Incomes Through Enterprise
BSC	Business Sub-Consortia
CAADP	Comprehensive Africa Agriculture Development Programme
CAPEX	Capital Expenditure
CDI	Clinton Development Initiative
CEO	Chief Executive Officer
CIAT	International Center for Tropical Agriculture
COVID-19	Coronavirus Disease 2019
CRDB	Co-operatives Rural and Development Bank
CSDI	Center for Sustainable Development Initiatives
DADPs	District Agricultural Development Plans
DAICO	District Agriculture, Irrigation and Livestock Cooperatives Officer
DFIs	Development Finance Institutions
DRC	Democratic Republic of Congo
EAC	East African Community
EAGC	East Africa Grain Council
EATIL	ETC Agro Tractors & Implements Ltd
EGS	Early Generation Seed
Enabel	Belgian Development Agency
ESRF	Economic and Social Research Foundation
ETG	Export Trading Group
EU	European Union
Faida MaLi	Faida Market Link
FAO	Food and Agriculture Organization
FDCs	Forward Delivery Contracts
FISFAP	Financial Inclusion for Smallholder Farmers in Africa Project
FRI	Farm Radio International
FST	Fertilizer Society of Tanzania

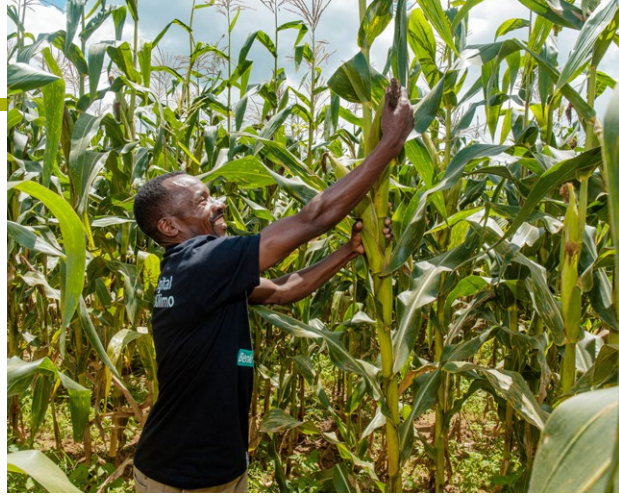
FtMA	Farm to Market Alliance
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GoT	Government of Tanzania
GPAD	Global Partnership for Africa Development
GPRS	General Packet Radio Service
GSMA	Global System for Mobile Communications
Ha	Hectare
ICT	Information and Communications Technology
IITA	International Institute of Tropical Agriculture
ITC	International Trade Centre
JRRC	Joint Results Review Committee
KADERES	Karagwe Development and Relief Services
KJP	Kigoma Joint Programme
KPD	Kaderes Peasants Development Plc
LGAs	Local Government Authorities
M&E	Monitoring and Evaluation
MEDA	Mennonite Economic Development Associates
MFIs	Microfinance Institutions
MIICO	Mbozi-Ileje-Isangati-Consortium
MIRA	Micro Reforms for Agribusiness
MoA	Ministry of Agriculture
MoU	Memorandum of Understanding
MP	Member of Parliament
MT	Metric Tons
NBS	National Bureau of Statistics
NCFI	National Council for Financial Inclusion
NFRA	National Food Reserve Agency
NGOs	Non-Governmental Organizations
NIC	National Insurance Corporation
NJORECU	Njombe Region Cooperative Union
NMB	National Microfinance Bank
NPHMS	National Post-harvest Management Strategy
NYDT	Nyakitonto Youth for Development Tanzania
OECD	Organisation for Economic Co-operation and Development
OPEX	Operational Expenditure
PASAAR	Policy Advocacy for Strengthened and Accelerated Agricultural Reforms
PHH	Post-Harvest Handling
PIATA	Partnership for Inclusive Agricultural Transformation in Africa
PO-RALG	President's Office in charge of Rural Administration and Local Government
PPP	Public-Private Partnership
PPTL	Pee Pee (Tanzania) Limited
QDS	Quality Declared Seed
RUCODIA	Ruvuma Commercialization and Diversification of Agriculture

RUDI	Rural and Urban Development Initiative
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SAKiRP	Sustainable Agriculture Kigoma Regional Project
SCALGA	Strengthening the Coordination of ASDP-II at the Local Government Authority level
SFSETT	Strengthening Food Security and Export Trade in Tanzania
SMEs	Small and Medium-size Enterprises
SUA	Sokoine University of Agriculture
SUKA	Sumbawanga–Katavi
TADB	Tanzania Agricultural Development Bank
TAIDF	Tanzania Agro-Industrialization Flagship
TAPBDS	Tanzania Association of Professional Business Development Services Providers
TARI	Tanzania Agricultural Research Institute
TASTA	Tanzania Seed Traders Association
TCB	Tanzania Commercial Bank
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TFRA	Tanzania Fertilizer Regulatory Authority
TOSCI	Tanzania Official Seed Certification Institute
TPB	Tanzania Postal Bank
TPRI	Tanzania Pesticide Research Institute
TZS	Tanzanian Shilling
UNCDF	United Nations Capital Development Fund
USA	United States of America
USAID	United States Agency for International Development
US$	United States Dollar
USSD	Unstructured Supplementary Service Data
VAT	Value Added Tax
VBAs	Village-Based Advisors
WFP	World Food Programme

Key Definitions

Business sub-consortia (BSC)	In the context of the AGRA consortia operation procedure, this is a group of agribusiness entities with mutual interest and inter-dependence operating in a specific geographical area. This defines a range of profit motive partners from input suppliers, hub agro-dealers, retail agro-dealers, village-based agricultural advisors, farmer groups, associations and/or individual farmers. Due to the mutual interest in their business operations, it is envisaged that the relationship built will sustainably exist beyond project funding period.
Consortium	This is an initiative that mobilizes public and private partners to improve market systems and serve farmers in a designated geography, value chain or industry.
Equipment lease finance	This is a type of financing in which business owners rent equipment rather than purchase it, in a contractual arrangement where the lender buys the equipment and then leases it to the borrower at a fee. Most equipment leases come at a fixed interest rate. In the consortia intervention in Tanzania, the common types of equipment lease were mainly farm production machinery such as tractors and post-harvest handling equipment (threshers).
Hermetic storage	Storage methods that use sealed, airtight equipment such as bags, silos, or cocoons to control moisture and insects in stored dry agricultural commodities.
Innovative finance	These are financing instruments and options for projects and businesses that would find it difficult to raise funds from traditional sources.
Input finance	This is a scheme that provides smallholder farmers with flexible ways to pay for seed, fertilizer, crop protection inputs and all other products used in farm production; with financing risk shared by banks (lenders), farmers (borrowers) and other value chain participants (e.g. buyers). It facilitates the use of cash collateral from value chain participants to secure farmer input loans, and the trust of value chain participants into farmer businesses by signing supply contracts.
Integrated delivery model	This refers to the provision of various goods and services to farmers in a coordinated manner. Providers of goods and services come together to serve farmers in a specific geography or a specific market. They coordinate the timing of each transaction and leverage each other's logistics and infrastructure. This coordination reduces costs of delivery and improves the quality of services delivered to farmers.
Last mile delivery	This refers to the process of making knowledge, information and inputs (and markets) locally accessible through enhanced extension delivery by village-based advisors, lead farmers, government extension agents, seed companies, agro-dealers, and output market actors.
Leverage	Indicates that the new investment was directly encouraged or facilitated by activities funded by PIATA. Investments reported should not include funds received by PIATA as part of the grant or other award.
Microenterprises	Microenterprises are businesses engaging up to 4 people, in most cases family members, or employing capital amounting up to TZS5 million (~US$ 2,173). Majority of microenterprises fall under the informal sector (Tanzania SME Policy, 2003).

Reverse extension	The approach whereby strong partnerships are formed with market actors (especially agro-processors) as the first entry point towards agribusiness consortia formation. Determination and prioritization of the gaps to be addressed is then made in reverse along the value chain back to the farmers, with respect to meeting market requirements. It is only after this that implementing partners are selected based on their competitive advantage in dealing with those gaps. This is because, market-driven partnerships formed by for-profit companies (traders and processors) develop and become stronger faster, compared to those initiated by non-governmental organisations. These for-profit companies also end up investing in provision of extension services to partners in their own supply chains.
Small and medium enterprises (SMEs)	According to the Tanzania SME Policy (2003), SMEs are businesses engaging between 5 and 99 employees or with capital investment from TZS5 million (~US$2,173) to TZS800 million (~US$347,800). The policy categorizes small enterprises as businesses engaging between 5 and 49 employees or with capital investment from TZS5 million (~US$2,173) to TZS200 million (~US$86,956); and medium enterprises as businesses that employ between 50 and 99 people or use capital investment from TZS200 million (~US$86,956) to TZS800 million (~US$347,800). Small and medium enterprises are mostly formalized.
Village-based advisors (VBA)	Trusted lead farmers who provide smallholder farmers with extension services, as well as input and output market linkages.



1. Introduction

Hatibu N.H., Rweyendela V., Karuho O., Muhinda M. J.J., Konde A.A.

Tanzania is one the countries that AGRA has supported to develop its agriculture sector. During the first 10 years, the focus was on developing six agricultural systems: seed, fertilizer and soil health, extension services, agro-dealership, markets and agri-finance (AGRA, 2017a). Investments to develop these systems were made separately. At the end of the first phase, AGRA commissioned studies on the agricultural sector in Africa to take stock of the trends and changes in the landscape. This was done in 11 countries as part of efforts to develop relevant and impactful programs.

The overall analysis revealed that developing agricultural systems in isolation did not guarantee scale and sustainability. It also emerged that private sector companies dealing in staple crops had started to seriously consider building supply chains that are inclusive of smallholder farmers; supporting them to access inputs and technologies required to produce and supply the right quality and quantity to the markets. National governments were also looking for sustainable solutions to boost agricultural production and alleviate the burden that input subsidies were placing on public finance.

By 2016, agricultural systems in Tanzania had achieved a sufficient level of development, but they required more integration and consolidation to make them more effective. Hence in 2017, AGRA shifted to integrating agricultural systems to build an ecosystem of agribusiness around smallholder farmers, including women and youth (Figure 1).

Building an Ecosystem of Agribusinesses around Smallholder Farmers

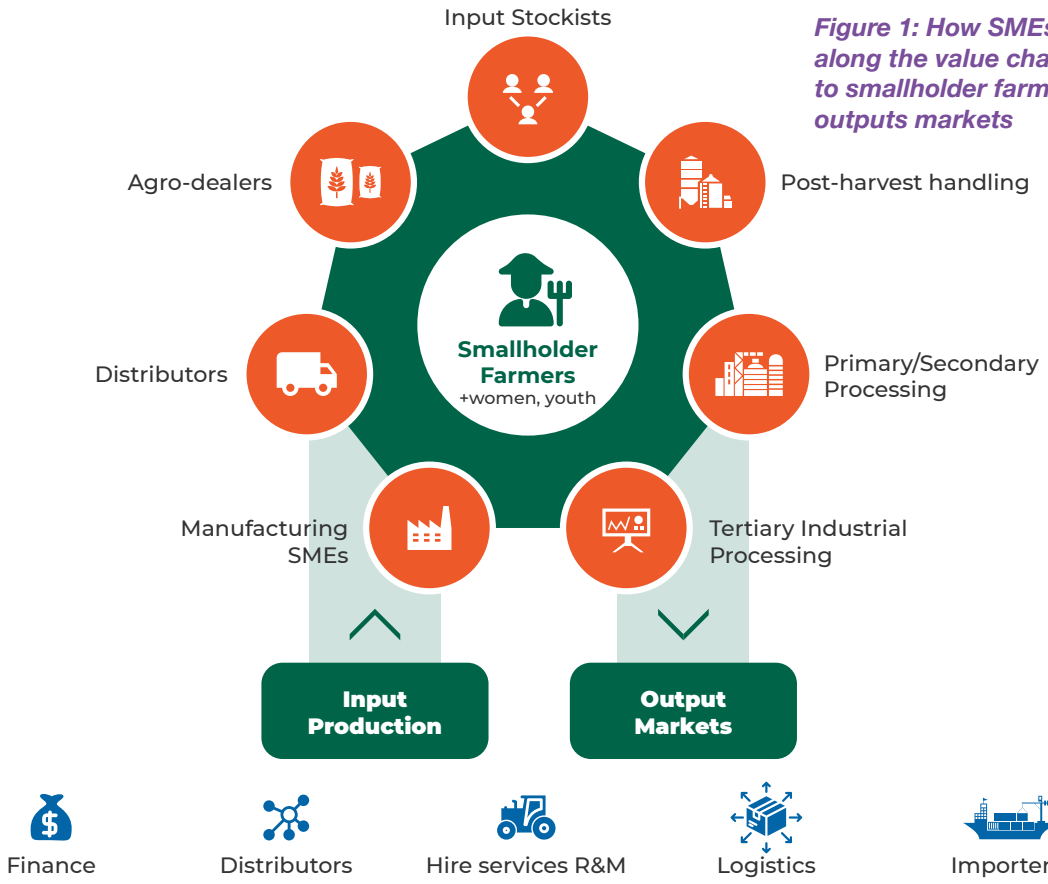


Figure 1: How SMEs are positioned along the value chain in relation to smallholder farmers, inputs and outputs markets

For effective integration of agricultural systems, AGRA and its partners decided to take a market systems approach. This is a multi-function, multi-player arrangement comprising the core function of exchange by which goods and services are delivered, and the supporting function and rules that are performed and shaped by a variety of market players.[1] This approach enabled AGRA and its partners to address the root causes of market failures. However, this necessitated a wide range of services and capacities to manage a system that involves many actors, with interventions focused on national, systems, and farmer levels.

This was a difficult undertaking due to the complex interrelationships and interests driving agricultural development, including:

- Public sector – policies, laws and regulations, and public institutions.
- Private sector actors including smallholder farmers themselves, SMEs, and large national and multinational agribusinesses.
- The need for resilience to shocks and stresses from climate and markets.
- Socio-cultural structures in smallholder farmer communities coupled with global and national agendas on empowerment of youth and women.

The work reported in this book pursued integrated interventions with respect to agricultural value chains, policies and state capabilities at national and local levels, as well as partnerships with large private sector organizations and programs by other development agencies. The aim was to enable the targeted smallholder farmers and value chains to attain the "tipping point", after which the transformation process would be self-sustaining at three levels (AGRA, 2017a):

a) Farmer level[2]: The point when:

- the proportion of smallholder farmers adopting innovative modern technologies and practices is sufficient to catalyze widespread adoption/demand and profit-driven supply of enough inputs and services.
- yields, volumes and quality of production deliver enough surpluses that bring significant profits to smallholder farmers while being competitive in local, national and regional markets.

b) Systems level: The moment when there are enough smallholder farmers in the market system willing to pay for inputs while delivering significant quantities of high-quality products, such that private sector input and output markets become self-sustaining.

c) Policy and regulatory framework at local and national level: The moment when:

- existing and new policies encourage business enhancing investments in the agriculture sector by both public and private sector.
- people begin moving out of production and into value addition/processing, as well as into sectors outside of food agriculture.

1 The Springfield Centre (2015). The operational guide for the Making Markets Work for the Poor (M4P) approach. Retrieved from https://beamex-change.org/resources/167/.

2 Focus group discussions with staple crop value chain actors revealed that 20%-30% adoption of improved technologies was sufficient to catalyze widespread adoption.

State Capability & Policy Engagement

Working with government to strengthen execution capacity while enhancing the transparency, accountability systems, and policy environment for increased public and private sector investment in agriculture.

Systems Development

Building downstream delivery systems closer to smallholder farmers while providing support to local private sector to scale technologies and services which deliver better productivity and incomes.

Partnerships

Facilitating the alignment between government priorities and private sector interests—improving integration and coordination to catalyze investments beneficial to smallholder farmers.

Figure 2: AGRA's three bodies of work that support integrated delivery

This publication attempts to answer the following questions:

a) Did the integrated delivery model attract business partnerships for the mutual benefit of all actors – smallholder farmers, SMEs, larger and more formal firms, including for-profit providers offering cross-cutting services (e.g., finance, transportation, business development, insurance and digital/telecommunication tools)?

b) If the answer to the above question is YES, then:

- How were these business partnerships formed and what were the incentives?
- Which business partnerships benefited along the value chain?
- How sustainable are these business partnerships?
- Will the momentum be sustained after AGRA support ends?
- What changes were made/introduced during implementation rather than planned up-front and who were the key innovators among the partners?

- Which initially planned approaches were dropped during project implementation and why?

c) If the answer to the question is NO, then what were the main causes of failure?

- Was it due to the approaches used?
- Was it due to the selected entry point (agribusinesses, farmers, government)?
- Was it due to constraints outside the control of the participating partners?

d) What are the key lessons for future interventions by key actors including governments, private sector and development partners seeking to build inclusive market systems beneficial for smallholder farmers?

Chapter 2 describes AGRA's agribusiness consortia approach, how it was implemented in Tanzania, and the overall results.

Chapters 3 to 6 document the performance of agribusiness consortia in four distinct agro-ecological zones of Tanzania while Chapters 7 and 8 describe the performance of thematic consortia that offered a platform to develop post-harvest management capabilities and inclusive finance.

Chapter 9 focuses on the results of AGRA's approach towards improving the policy environment for smallholder farmers and agribusiness to engage in staple crop value chains profitably and sustainably. It also highlights the results of AGRA's efforts to strengthen the capacity of government institutions at central and local level to deliver on their mandate. Chapter 10 presents a summary of aggregated outcomes and lessons from the Tanzania program.

Even though this book covers the investments made during the strategy period of 2017 to 2021, it also draws on the results and lessons learned during the first phase of AGRA's support to Tanzania between 2006 and 2016 (AGRA, 2017b).

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2. The Agribusiness Consortia Approach

Karuho O., Agaba E., Hatibu N.H., Rweyendela V., Obare N., Muhinda M.J.J., Bigirwa G.

Key Messages

- Value chain integration can accelerate systems development.
- The agribusiness consortia approach reduces the total cost of systems development and leads to significant positive systemic changes that persist beyond AGRA's involvement.
- Agribusiness consortia facilitated by non-profit organizations evolve into private sector-led agribusiness consortia due to strengthened trust among market actors.
- The end game is a platform that integrates agricultural systems and value chains in an inclusive and competitive manner.
- To effectively measure the success of the consortia approach, a robust monitoring and evaluation (M&E) system needs to be in place to capture and report impact by showing the difference over time between the treatment and statistically identical comparison group.
- The consortia approach does not equally impact all the agricultural systems. In the case of Tanzania, the input markets performed better than the output markets.

Key Words

agribusiness, value chain integration, agricultural growth corridor, cluster development, agro-industries, platform

Introduction

AGRA works with different actors to support the transformation of the agricultural sector from subsistence to food security, income, and an employment-generating sector. These actors include farmers, agri-SMEs, non-profit organizations, and governments. Private sector partners address different issues along the value chain, and their operations complement each other. While non-profit organizations play a mobilizing role, governments provide an enabling environment through policy dispensations and investments in public goods.

Since its inception, AGRA has focused on developing agricultural systems with a major emphasis on seed, fertilizer, soil health, agro-dealership, extension, markets, and agri-finance. However, by the end of its first phase of funding (2006-2016), AGRA had realized that developing systems in isolation did not guarantee scale and sustainability (AGRA, 2017). The dynamics in the agricultural landscape were also changing; companies dealing in staple crops were willing to build supply chains inclusive of smallholder farmers and support them to access the inputs and technologies required to produce and supply the right quality and quantity to the markets. Government leaders were also looking for sustainable solutions to boost agricultural production and alleviate the burden that input subsidies were placing on public finance. This realization led AGRA to recast its business and operational models, transitioning from layered programs to integrated programming, coordination, and partnerships. In thinking through

the design, AGRA chose to use the agribusiness consortia approach to strengthen agricultural systems for scale and sustainability. This approach prioritized value chain integration as a way of accelerating systems development.

Value chain integration is defined as "the process in which multiple enterprises within a shared market cooperatively plan, implement, and manage (electronically and physically) the flow of goods, services, and information from the point of origin to the point of consumption in a manner that increases the customer-perceived value and optimizes the efficiency of the chain, creating a competitive advantage for all stakeholders involved" (Wong, Kaur & Choong, 2010, p.3).

To reduce costs and strengthen the resilience of supply chains, AGRA encouraged agribusinesses to partner with their counterparts investing in various segments of the value chains and farmers. These business partnerships have the potential to accelerate the adoption of integrated business models with the "capacity to produce, procure, process, and deliver raw material inputs that are at the heart of the modern agri-food system" (Murphy, Burch, & Clapp, 2012, p. 8).

AGRA conceived and developed the model of the integrated consortium, which is a carefully selected group of rural organizations and businesses that agree to work in a coordinated manner to deliver the benefits of the critical components for agricultural transformation (seed, fertilizer, agro-dealership, extension, markets, and agri-finance) to a specific group of farmers in a defined geography.

Source: Kearney (2016)

Figure 3: The integrated consortium model

Agribusiness Consortia in Tanzania

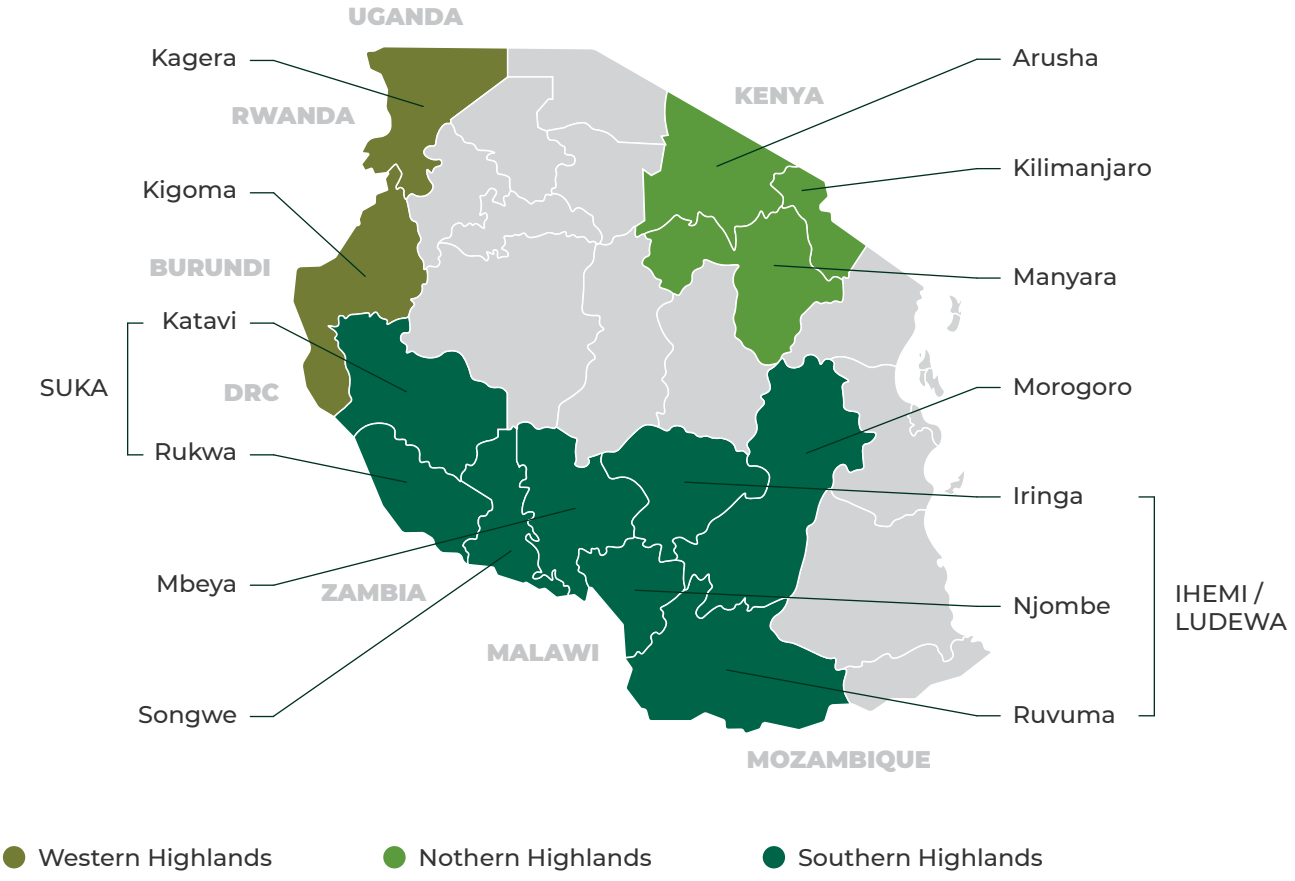
Tanzania adopted an agricultural growth corridor approach to transforming its agricultural sector from subsistence to commercial farming. The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) was designed to mobilize investments and address bottlenecks preventing the agriculture sector from reaching its potential in the Southern Highlands of Tanzania (Jenkin, 2012).

Agricultural trade corridors are operationalized through the development of clusters. This spatial approach seeks to focus resources on a specific geographic area that has the required natural endowment and develop farmers, markets, and agricultural support systems including infrastructure, finance, and public investments and policies, as well as agricultural resilience support systems to strengthen local competitiveness and improve trade within the country, across regions, and internationally (Kearney, 2016).

AGRA made a strategic choice to focus on clusters within the SAGCOT corridor to ensure that they become operational and transition from stand-alone interventions to integrated approaches that involve value chain actors, including input dealers, grain handlers and farmer groups, and support systems such as mechanization service providers, and financial institutions.

In addition to the Southern Highlands, AGRA introduced the consortia model to the Western and Northern Highlands of Tanzania as well. These three agro-ecological zones were selected for their intrinsic opportunities and unique barriers to agricultural transformation.

Locations of the Agribusiness Consortia in Tanzania (2017–2021)



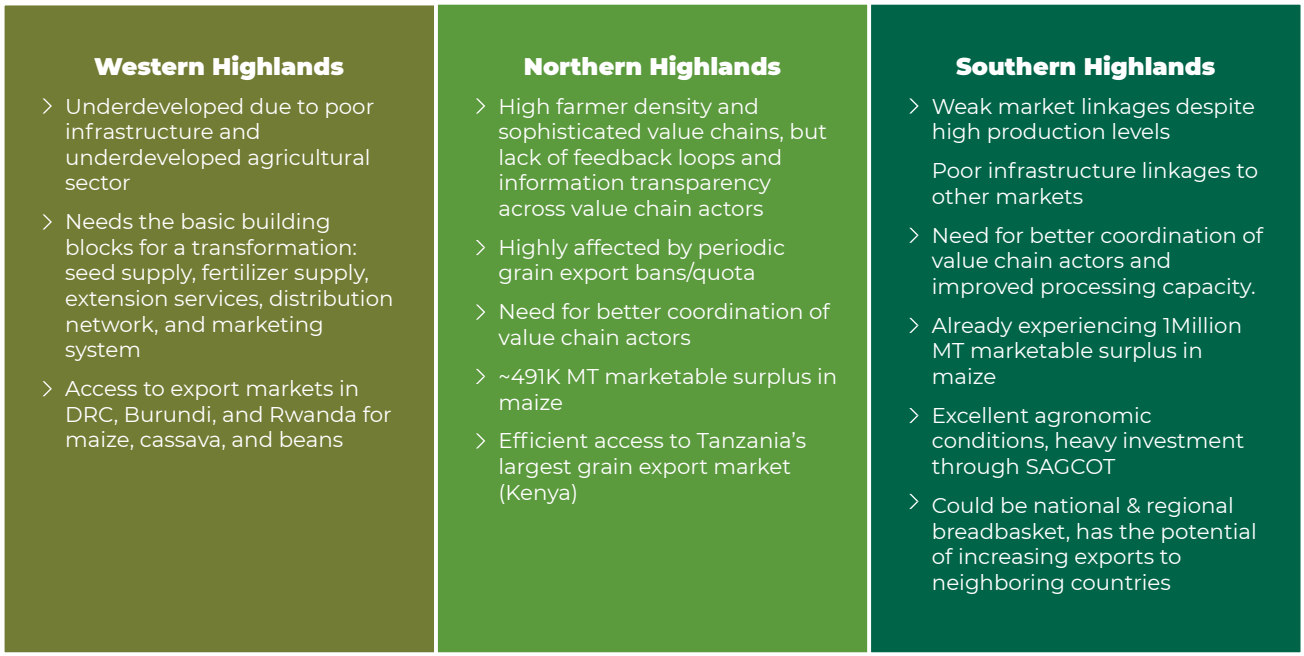


Figure 4: Locations of the agribusiness consortia in Tanzania (2017–2021)

The model was designed to drive systems development at scale through:

a) coordinated deployment of actors with expertise and records of accomplishment in enabling the development of different segments of agricultural value chains that must be upgraded and synchronized to deliver sustainable positive systemic changes.

b) simultaneously working with private sector actors along the agricultural value chain from producing and manufacturing inputs upstream to retailing processed products to consumers downstream.

c) deploying AGRA's resources to provide technical support and help drive a range of proven models and technologies that can be taken to scale.

d) supporting the improvement of the policy environment and state capabilities at national and sub-national levels in order to put in place the right vision, leadership, policies, regulations, and institutions (with implementation capacities), resulting in a conducive environment for growth and inclusive value chains.

In Tanzania, the agribusiness consortia model was adapted to the local context, and entry points took into consideration the dynamics in each agro-ecological zone:

- In the Southern Highlands (Iringa, Njombe, Ruvuma, Rukwa, and Katavi), where production and productivity levels were high, AGRA focused on expanding market opportunities by supporting value addition, structured trade, quality enhancement, and aggregation.
- In the Western Highlands (Kagera and Kigoma), AGRA's interventions strengthened input supply systems and linkages to output markets to facilitate the uptake of yield-enhancing agricultural technologies.
- In the Northern Highlands (Arusha, Manyara, and Kilimanjaro), AGRA's interventions focused on supporting SMEs and farmers to adopt improved post-harvest technologies and improving access to trade finance in order to supply cross-border markets, especially Kenyan millers.

Building on Previous Investments (2006 - 2016)

AGRA has been working in Tanzania since 2006, with its investments focused on increasing incomes and improving the food security of smallholder farmers. These objectives were achieved through: improvement of smallholder farmers' productivity; creating linkages between market and production systems; and supporting the development of an enabling environment.

In its first decade of existence, AGRA invested US$51.29 million in Tanzania and achieved the results summarized in Figure 5.

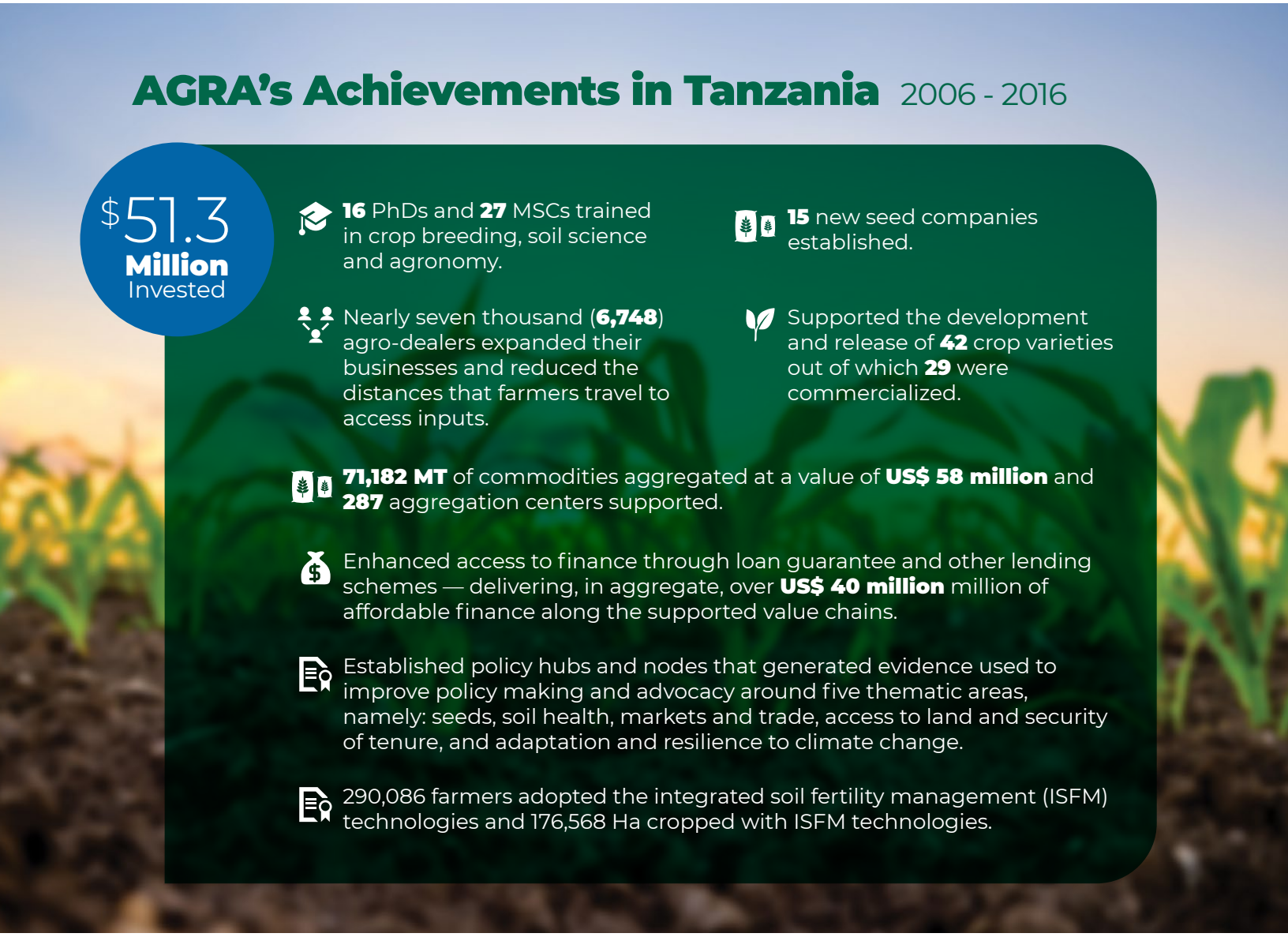


Figure 5: AGRA's achievements in Tanzania 2006–2016

While the first phase contributed to the development of national agricultural systems, the second AGRA strategic period (2017 to 2021) focused on building upon the successes of the previous phase to accelerate the inclusive agricultural transformation and directly support 1.5 million smallholder farmers to increase incomes and improve food security while reaching another 2.5 million farmers indirectly.

As illustrated in Figure 6, the main objectives of AGRA Tanzania programs were fully aligned with the government's priorities as outlined in the second phase of the National Agricultural Sector Development Program (ASDP-II). AGRA was an active member of a network of public institutions, development partners, academia, and non-governmental organizations (NGOs) that were involved in the development of ASDP-II, which was launched by President John Magufuli on June 4, 2018. AGRA's role in this process focused on the socialization of the program at the level of local government authorities (LGAs).

To build a strong foundation for the sustainability and scaling-out of agricultural systems, AGRA supported both national and local governments to develop agricultural development plans. Support in this area focused on:

a) Strengthening the coordination of ASDP-II at the local government authority level, through the President's Office Regional Administration and Local Government (PO-RALG). The aim was to enhance the capacity of local governments to drive and coordinate the implementation of the ASDP-II, with focus on strengthening coordination, M&E capabilities, and the production of high-quality District Agricultural Development Plans (DADPs) to attract funding from the national government and other public sources, and private sector investments required to transform the agriculture sector in each district.

> "Over the last three years, AGRA has worked closely with us to implement the integrated consortia program bringing private sector companies on the same platform for improved coordination with local governments. The development of DADPs benefited from this experience and our planning time decreased from 6 months to 3 months."
>
> **Prof. Siza Tumbo, Deputy PS Ministry for Agriculture, United Republic of Tanzania**

> "I thank AGRA for their support in building the capacity of our staff to prepare quality district agriculture development plans (DADPs) in 12 regions and 30 local government authorities (LGAs). The DADPs are mini-ASDPII that take into account the unique characteristics in each LGA and utilize a value chain approach to assess opportunities for agricultural investments. So far, the DADPs have helped to secure US$2.8m from LGAs own resources, while there is potential to bring in another US$25m from funds earmarked for SMEs."
>
> **Prof Riziki Shemdoe, PS in PO-RALG**

b) Design and implementation of the Tanzania Agro-Industrialization Development Flagship (TAIDF) through the ASDP-II secretariat and the Prime Minister's Office. TAIDF is a framework for coordinating and mobilizing investments for agro-industrialization, a sector with the highest economic multiplier effects, including direct, indirect, and induced economic multipliers (Kaliba, et al., 2008).

> "AGRA's support for the development of the flagship on agri-industrialization is not only in line with the sector priorities as outlined in the ASDP-II, but it also speaks to the current priorities of the Ministry of Agriculture to increase productivity, value addition, and enhanced competitiveness of the sector."
>
> **Prof. Adolf F. Mkenda (MP), Minister for Agriculture, United Republic of Tanzania**

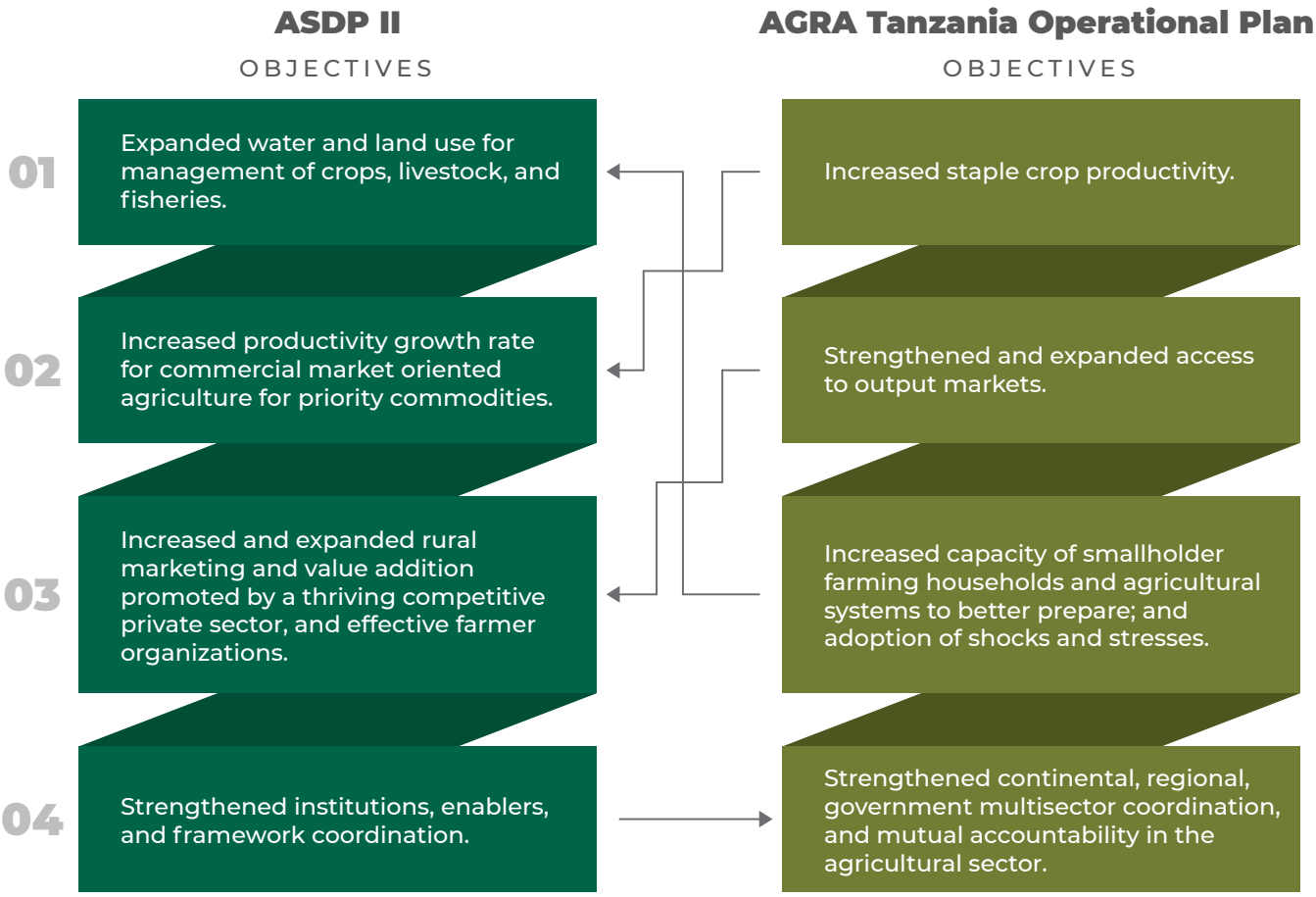


Figure 6: The AGRA Tanzania 2017-2021 Operational Plan as aligned to ASDP-II

Governance of the Agriculture Sector in Tanzania

Management and governance of the agriculture sector in Tanzania falls under different ministries, collectively known as the agriculture sector lead ministries (ASLMs). However, there is a dedicated Ministry of Agriculture (MoA) that provides the overall leadership and strategic direction. It is responsible for formulating policies, strategies, programs, and laws that guide the sector's development. MoA is also the face of the sector and is responsible for engaging development partners, donors, and other actors interested in agriculture investments.

The Ministry in the President's Office, Regional Administration and Local Government is responsible for the implementation of policies, strategies, and programs that are formulated by the MoA. It manages and supervises extension services, and all agricultural workers report to it. Other ASLMs are also important because their activities impact agriculture development. The Ministry of Land, for example, is responsible for administration of title deeds and land transfers, while the Ministry of Trade is responsible for trade and export policies.

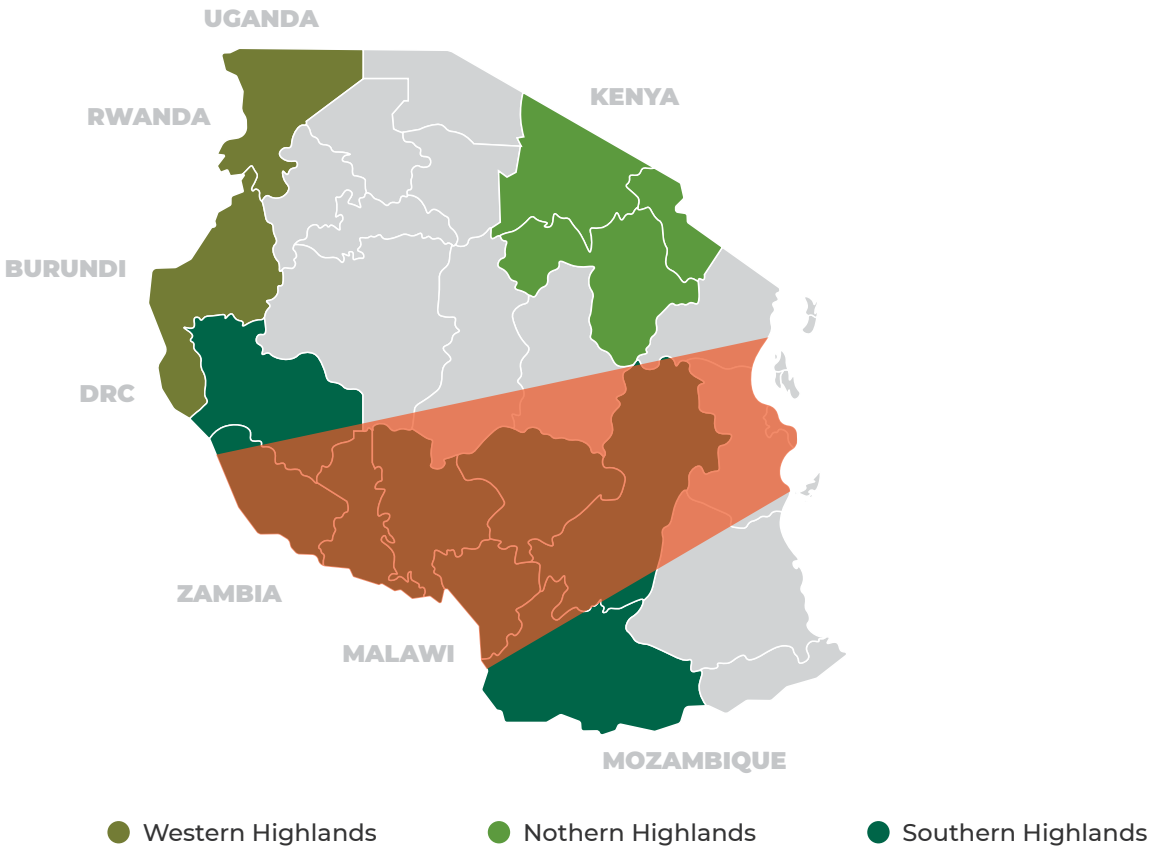
AGRA Tanzania aligned its work with the sector governance structure by posting staff to specific LGAs where consortia interventions were implemented. At the national level, there were regular engagements with senior decision makers at MoA to strengthen the ownership and collaboration for work that AGRA implements in the country.

Strengthening and Integrating Systems to make SAGCOT a Vibrant Corridor

The SAGCOT initiative was born out of the deliberations of the World Economic Forum on Africa held in May 2010 in Dar es Salaam, Tanzania. The idea behind the initiative was to support efforts by the government, the citizens, and other stakeholders to realize agricultural transformation (Jenkins, 2012).

The Southern Agricultural Growth Corridor (also known as the Tazara Corridor) is found along the traditional trade route linking Tanzania to landlocked countries in south-eastern Africa. Regionally, the corridor reaches mining industries in the northern and central provinces of Zambia, Malawi, and Katanga Province in the Democratic Republic of Congo (DRC). The corridor has a diverse range of climates and altitudes and a diverse nature of soils, allowing for the cultivation of various crops and rearing of different types of livestock.

Key clusters that are being developed within this corridor include Kilombelo, Rufiji, Ihemi, Mbarali, Ludewa, and Sumbawanga.



Source: SAGCOT

Figure 7: SAGCOT corridor

AGRA made a strategic choice to support Tanzania's agricultural transformation agenda using assets and know-how in technologies, partnerships, markets, agri-finance, and delivery models that if scaled, could lead to a competitive and inclusive agricultural sector in Tanzania.

In SAGCOT, AGRA aimed to expand market opportunities by supporting value addition, structured trade, quality enhancement, and aggregation to respond to the opportunity presented by the potential to increase exports to the Malawi, DRC, and Zambia markets, and leverage AGRA's tested models (integrated breadbasket, hub agro-dealers, SME development, and farm to market alliance) in this zone. Therefore, the consortia model was deployed

to de-risk local private sector players and incentivize them to support inclusive agricultural production, provision of agricultural inputs, extension services, and crop marketing for key value chains including maize, rice, bean, and soybean.

> "For SAGCOT to achieve its goal – to promote inclusive, sustainable and commercially viable agricultural value chains in the southern corridor of Tanzania – partnership with providers of capital, technologies, markets, and policymakers is essential. To this end, SAGCOT has been working with AGRA and the government to mobilize private sector partners and de-risk their investment in agriculture systems that are required for a vibrant agriculture growth corridor."
>
> **Geoffrey Kirenga, CEO SAGCOT**

Key Characteristics of the Consortia Work

To kickstart the process of systems integration and delivery at scale through agribusiness consortia, AGRA partnered with non-profit organizations and government institutions to lead in mobilizing and brokering business relationships among key actors in the main commodity value chains. This was done to the point of enough repeat transactions that enabled agribusinesses to sustain their business relationships without needing a facilitating agency or organization (Tadesse & Shively, 2013).

The following are the key steps AGRA took to develop agribusiness consortia in Tanzania:

1. **Analyzing the drivers of value chain performance and the interconnectedness of actors** as well as the enabling environment that creates incentives for the actors. Key considerations in the analysis of opportunities included:
    - Industry and market analysis
        - Market fundamentals: Demand and supply
        - Basis of competition (value-based or cost-based competition, as well as actors' behavior and business models)
        - Policy environment
        - Key players and their capacity.
    - Supply chain and value chain analyses to understand the following:[3]
        - Movement of goods and services
        - Transaction costs at every step of the supply chain
        - Value leveraged and captured at every step of the value chain.
    - Technical solutions and their economic evaluation
        - Seed, fertilizer, agro-dealership, extension, financial products, and target market segments, policy and institutional capacity required to solve either supply or demand issues in selected markets/ value chains.
    - Economic viability, inclusiveness, scale, and resilience
        - Prospects for private sector profitability
        - Prospects for impacting poor farmers, youth, and women
        - Ability to strengthen absorptive, adaptive, and transformative capacities of farmers and the entire agricultural sector.

3 Refer to chapter 3 to 8 for more details on selected value chains under each geography

2. **Facilitating transactional and transformational relationships** between primary market players, service providers, and policymakers. AGRA played this role directly and through its implementing partners.
3. **Leveraging private and public investments and expertise** in agricultural market infrastructure and processes. This entailed piggybacking onto private and public investments to promote staple crops and to develop allied/supporting/complementing industries (e.g., poultry, out-grower schemes), and developing clusters of interconnected agribusinesses and providers of supporting goods and services such as capital, expertise, and technology providers.
4. **Partnering with relevant institutions and businesses** to kick-start and scale up innovation for agricultural transformation.

The process of setting up and operationalizing the agribusiness consortia model involved stakeholder mapping, analysis, and engagement (assessing the power and influence of stakeholders as well as their interests and capacity). Other key considerations included:

- Common purpose
- Commitment
- Power balance
- Roles and responsibilities
- Communication framework
- Project implementation office
- Consortia governance
- Peer learning
- Knowledge capturing and codification.

The result of this analysis informed the configuration of consortia, including the types of partners, level of interaction, and leverage points.

Types of agribusiness consortia

Discussions were held with the different partners to determine and agree on the consortium model fit for a particular location, value chain, and prevailing circumstances. The description of the consortia model, roles, and responsibilities of partners were defined in the grant award letter and partnership deed, which are legally binding and enforceable documents governing the operations of the consortia. Summary descriptions of the models are provided in Table 1.

Table 1: Agribusiness consortia that were considered by AGRA

Approach type	Description	Benefits	Disadvantages
Lead grantee with multiple grantees	• AGRA gives multiple grants but appoints a lead grantee as a focal point for coordination • AGRA enters into individual agreements with each of the grantees • Jointly, the grantees sign the deed of adherence	• Efficient flow of funds • Strong synergies from consolidated individual value chain expertise amongst partners • Ease of coordination	• Challenges due to multiple reporting lines • Duplication of roles and competition among partners

Approach type	Description	Benefits	Disadvantages
Lead grantee with sub-grantees	• AGRA channels all grant money through the lead grantee • AGRA grantee appoints sub-grantees to implement certain aspects of the project • AGRA may or may not be involved in selecting sub-grantees	• Cost-effective • Centralized funding and reporting to AGRA • Improved coordinated delivery through project office	• Lack of oversight on the performance of the sub-grantees • Exposure to weak financial controls between the lead partner and sub-grantees
Several grantees coordinated by an independent project manager	• AGRA contracts a consultant (independent project manager) to manage the project • AGRA enters into individual agreements with each of the grantees • Jointly, the grantees sign the deed of adherence	• Ease of coordination – dedicated individual/firm to oversee the day-to-day activities of the project	• Increased overhead costs resulting from multiple coordination roles between AGRA and the independent project manager

Annex 2.1 provides a generic list of the key roles, skills, and responsibilities of implementing partners, and deliverables expected from consortium members.

Other configurations

In addition to integrated agribusiness consortia dealing with multiple value chains, AGRA also supported consortia that addressed a specific segment in the value chain or themes (e.g., post-harvest management, agri-finance). These thematic consortia leveraged and supplemented the integrated ones as they were implemented in the same geographies within Tanzania.

Consortia as Platforms for Effective Partnerships

AGRA's strategic vision can only be achieved through strong, transformative partnerships with many actors at all levels. These actors include governments, regional institutions, development partners, technical institutions, private sector, NGOs, civil society, and most importantly, farmers.

In the case of Tanzania, the agribusiness consortia platforms attracted:

- development partners e.g., Enabel (Belgian Development Agency) in Kigoma and World Food Programme (WFP) in the Southern and Northern Highlands.
- private sector companies e.g., Silverlands, SeedCo, Yara, ZamSeed, Syngenta and Meru Agro.
- government entities e.g., local administration, research centers and regulatory bodies.
- financial institutions e.g., Equity Bank, Tanzania Commercial Bank (TCB), Tanzania Agricultural Development

Bank (TADB), Co-operatives Rural and Development Bank (CRDB) and National Microfinance Bank (NMB), insurance providers (e.g., Reliance Insurance, NIC), and mechanization firms (e.g., Agricom Africa Ltd, LonAgro, EFTA Ltd, ETC Agro).

These partners offer many benefits, which include:

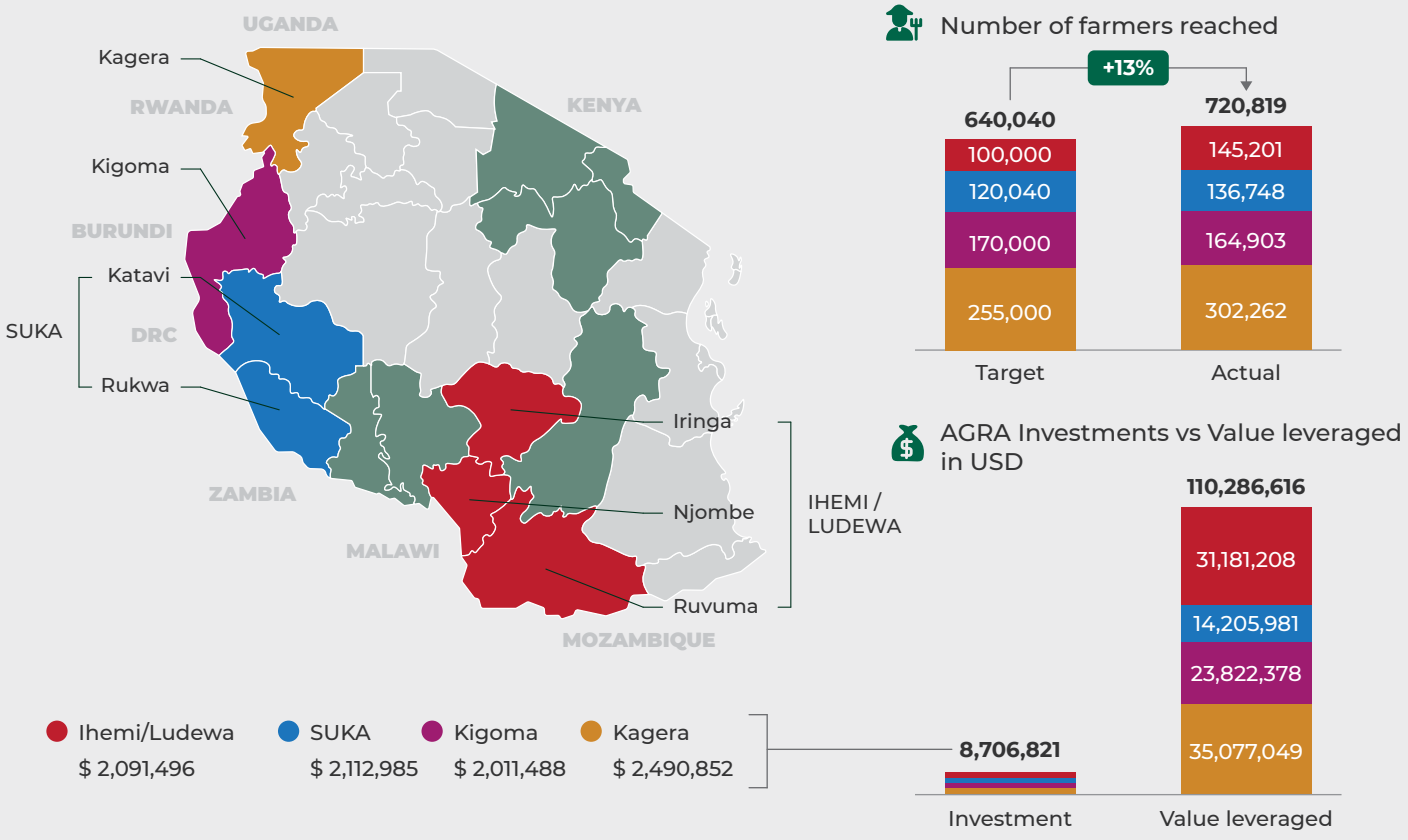
- Providing funding for our programs.
- Providing strategic support to scale up programs.
- Providing market access to smallholder farmers for their production.
- Facilitating access to finance for smallholder farmers.
- Providing agribusiness links to smallholder farmers to access yield-enhancing inputs, post-harvest management, logistics, and markets that can deliver returns to farmers.

AGRA prioritizes partnerships whose objectives resonate with its results framework and its ambition to impact farmers. The selection of partners is based on their ability to (1) increase farmer reach, (2) increase farmer income, (3) accelerate systems development, (4) unlock additional resources, and (5) strengthen the resilience, sustainability, and scale of the desired impact. AGRA has a rigorous process for onboarding partners that includes carrying out due diligence and evaluation.

Overall Results from Agribusiness Consortia

AGRA Tanzania has been tracking the impact of agribusiness consortia interventions at the farmer, business, and national levels as reflected in the figure below.

AGRA invested **US$ 8,706,821** to support **4 integrated** consortia in Tanzania. The value leveraged by these consortia from 2017 to 2019 is **US$ 110,286,616.** This means that each **US$ 1** that AGRA invested created **US$ 12.**



Other results for the period 2017 - 2019

Farmer-level Impact

- Rice yield increased by 12% (from 5.6 MT to 6.3 MT/ha).
- 47% increase in factory gate price due to improved quality of maize (a quality premium of TZS 450 to TZS 660 per kg i.e. from USD 205 to USD 300 per MT).
- US$66.3 million worth of produce sold through structured markets.

Business Impact

- Increased beans export sales from US$ 239,130 to US$ 19,565,217.
- US$6 million worth of beans EGS produced and sold.
- US$13.3 worth of fertilizer sold to farmers participating in consortia activities and transactions.
- US$16 million worth of seed produced and sold by seed companies and agro-dealers.

Increased storage and processing capacity.

Government Impact

- Consortia catalyzed the Tanzanian input market attractiveness and scale and effectively replaced government input subsidy program that was phased out in 2016.
Off-taker-based input finance with 50% down payment has been widely adopted.

Sustainability

42 Business Sub-Consortia (businesses investing in processing, input production and distribution) engaged in repeat transactions that would potentially remain operational beyond AGRA's support.

NB
Value created: new private sector investments, seeds & fertilizer sold, value of produce sold through structured markets, loans from financial institutions

Figure 87: Cumulative performance of consortia interventions in Tanzania[4]

The results shown above were achieved in the overall context where Tanzania experienced a decrease in the overall production of key cereal crops as shown in Figure 9.

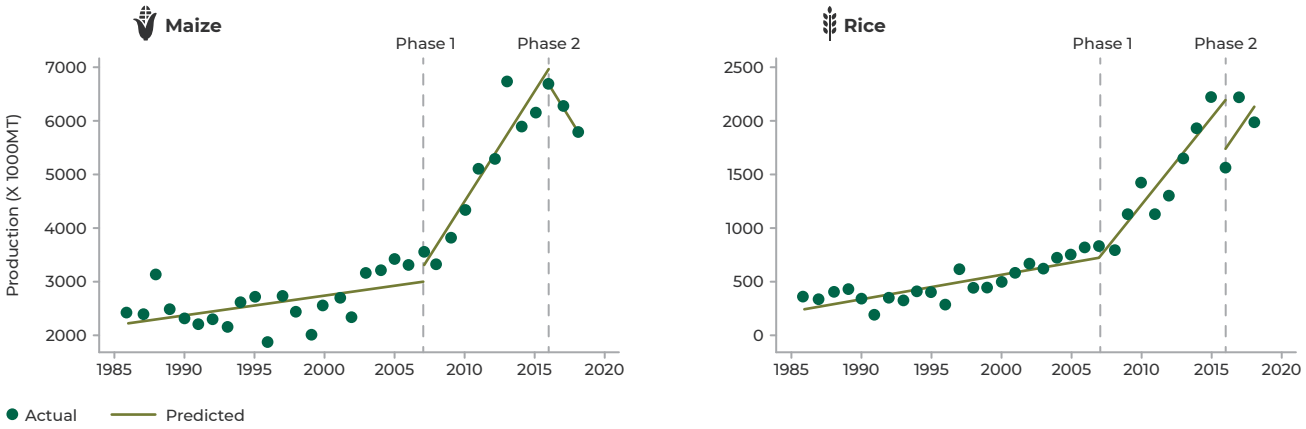


Figure 9: Actual and model-predicted maize and rice production in Tanzania between 1985 and 2019[5]

4 Refer to chapters 3 to 8 for disaggregated data by each consortium.

5 Final PIATA Impact Evaluation (Mathematica 2021).

This decrease may be attributed to the (1) export ban that discouraged farmers to produce more without assured markets, (2) discontinuity of the government input subsidy program, (3) droughts and floods, and (4) outbreak of fall army worms.

Evolution of agribusiness consortia in Tanzania

There are breakdowns along the supply chains due to lack of or limited coordination among agribusinesses, and weak market signals given to farmers. Farmers complain about lack of markets while agribusinesses complain about inability to secure produce in the right quantity, quality, and on time. This situation is transformed through the following steps, which also indicate the evolution of the consortia:

1. Non-profit organizations mobilize and coordinate agribusinesses and farmers; they start planning and coordinating production and marketing activities, including access to finance, aggregation, technology, and extension.
2. Due to repeat transactions among these agribusinesses and with farmers, the role of facilitators (non-profit organizations) is eliminated and the transactions continue, thus creating business sub-consortia.
3. Modern agribusiness platforms that integrate agricultural systems and value chains are then developed. These can be digital or physical.

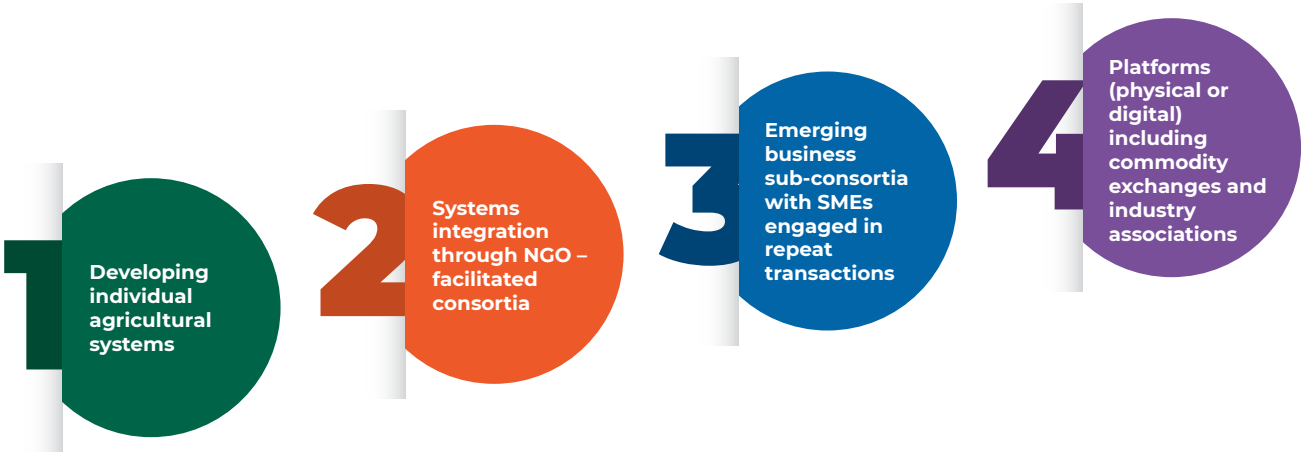


Figure 10: Evolution of business consortia

The end state is to have a mature platform that enables value chain actors to transact efficiently and effectively (ISF Advisors, 2021). This platform may be an industry association or a commodity exchange platform that facilitates the flow of goods and services throughout agro-industries and value chains.

Innovative joint reviews and consultations

Mechanisms of accountability were put in place to regularly review and recommend course corrections for all the agribusiness consortia:

- **Joint Results Review Committee (JRRC)** was constituted by the technical team leaders among each of the implementing partners contracted by AGRA, as well as all the technical leads from AGRA. Meetings were conducted in January, April, July, and October, and the JRRC conducted joint reviews of the results delivered during the immediate past quarter to ensure effective delivery in terms of time, quality, and completeness. The committee also articulated implementation challenges and enabled lessons learned and potential solutions to be shared among all the implementing partners in Tanzania. Most important, the JRRC ensured synergies and integration in implementation.
- **Steering Committee (SC)** were constituted by the chief executive officers (CEOs) of each implementing partner. Meeting twice a year, in January and July, the committee provided joint and participatory oversight

on the delivery of results, evaluation, and learning. The involvement of local government authorities ensured local ownership of all the initiatives. The Assistant Regional Administrative Secretary for Economic and Productive Services was a full member of the SC, enabling the consortia program to be mainstreamed at the regional administration level.

Other Delivery Approaches Considered

In the process of selecting a suitable delivery approach, AGRA considered the following alternatives:

1. Small grants to grain traders and processors to increase their capacity and expand market opportunities for smallholder farmers. AGRA had had success in supporting local seed companies and agro-dealers to increase the availability and adoption of crop varieties. AGRA thought of using the same approach to develop the output market to encourage farmers to continue investing in improved technologies. However, this option was discarded because there were more than 30,000 small businesses dealing in grain trading and processing in Tanzania and AGRA did not have the required footprint to work with each of these SMEs.
2. Working with industry associations and district crop aggregation fora (jukwaa la mazao) as coordination platforms. This option was discarded as these fora were at the infancy stage and only focusing on crop aggregation without considering markets as a pull for crop production and quality management.
3. Supporting local governments to coordinate actors in the input and output markets. In Tanzania, the extension system is managed by local governments, AGRA thought of providing direct budget support to the government to drive integration at local government. This option was not viable since extension agents were few and focused on production issues rather than taking a system approach. Furthermore, their incentives and performance system were not shaped by the markets and levels of transactions among market actors.

Therefore, AGRA chose to partner with local non-profit organizations to mobilize local SMEs and bring them to the same platform for joint business planning, coordination, cooperation, and integrated delivery to smallholder farmers in the same locality.

Weaknesses and Opportunities for Improvement

The design of this agribusiness model exhibited some weaknesses that limited its effectiveness during implementation. These weaknesses and ways of improving the model are discussed here.

1. The M&E system was not designed to capture the additionality of the model in a way that is comparable to areas or businesses that did not participate in this initiative. Counterfactual data collection and analysis methods should have been used to track the difference between treatment and comparison groups.
2. Non-profit organizations were in the driver's seat, providing services to consortia members rather than sticking to their facilitation role. Heavy involvement of non-profit organizations may have slowed down the development of business relationships among various actors. In consultation with agribusinesses participating in each consortium, AGRA should have recruited an independent consultant with experience in deal-making to assume the leadership role.
3. The consortia approach assumes that every market actor has assets and capabilities they need to be profitable. Market actors on the input side have a business advantage and incentives for participating in the agribusiness consortia as they put them in direct contact with their end market. They are further facilitated through extension, government programs on input distribution and private sector agro-dealers who deliver value to the original input supplier. However, on the output market side, processors and off-takers require support to build their markets first before investing in supplier relationships with farmers. To invest in product development and marketing for agri-food SMEs to build forward market linkages requires time and a lot of financial resources. Future agribusiness consortia platforms should work with agri-food SMEs to build forward market linkages, expand end market opportunities and translate these into backward linkages with smallholder farmers.

Conclusion

The agribusiness consortia model provides stakeholders with an opportunity to build competitive agribusinesses and reduce the cost of transactions. This model also enables stakeholders to solve key market failures, including limited predictability and efficiency of input and output markets. In addition, the integration of agricultural systems and value chains creates investment opportunities that benefit smallholder farmers and agri-food SMEs operating upstream, midstream, and downstream of agricultural value chains. The incentives of working together on the same platform are clear, but the capacity of agri-food SMEs to expand and sustain their investments in smallholder-dominated farming systems must be enhanced through improved access to finance, technologies and innovation, expertise, and expanded end markets.

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Annex 2.1: Roles and Responsibilities of Implementing Partners within a Consortia

(a) Markets and trade (development and linkages)

Skill sets required from the implementing partners	Generic description of contracted outcomes	Generic description of contracted outputs
• Ability to build commercial linkages of smallholder farmers to markets. • Ability to build strong and inclusive value chains. • Experience in analyzing markets and trade. • Track record in developing trading systems and capabilities of smallholder farmers and SMEs. • Ability to implement "reverse extension", to drive decisions and capacity of smallholder farmers as well as inputs suppliers to adequately respond to market needs.	• Increased use of structured and/or repeat order markets. • Increased quality of produce by smallholder farmers in relation to market demand. • Investment made by SMEs for structured markets with targeted smallholder farmers. • Increased volume and profitability of produce sold by smallholder farmers.	• Smallholder farmers linked to market demand of both anchor buyers and local alternative markets. • Aggregation centers upgraded to meet buyer quantity and quality requirements. • Partnerships created between farmer organizations and grain traders to handle the marketable surplus. • Volume-based forward contracts signed and honored. • Business case and value proposition for grain traders, processors and aggregation centers built.

(b) Primary handling and aggregation

Skill sets required from the implementing partners	Generic description of contracted outcomes	Generic description of contracted outputs
• Experience in projects that promote post-harvest handling (PHH) technologies adoption and supply. • Ability to offer extension services and capacity building on delivery of quality standards and use of weights and measures to maximize benefits from selling produce.	• Reduced post-harvest losses. • Increased use of improved post-harvest technologies and practices by smallholder farmers and SMEs. • Increased sustainably of SMEs producing, supplying, distributing and/or providing hire services for improved PHH technologies and practices.	• Cubic meters of storage space developed and/or refurbished and certified. • Smallholder managed warehouses equipped with moisture meters, weighing scales and G-soko software. • Farmers trained on post-harvest management and new technologies available for post-harvest management. • Distribution and acquisition of technologies, particularly among smallholder farmers facilitated. • 15,000 extension materials on new technologies in PHH, developed and distributed.

(c) Modernizing farming for smallholder farmers

Skill sets required from implementing partners	Generic description of contracted outcomes	Generic description of contracted outputs
• Ability to pilot, test, and scale up information and extension delivery models (private–private, public sector [where they work], or public–private models). • Experience in enhancing the knowledge base available to information and extension service providers and farmers, from selected extension & research institutions in the country. • Building the linkage and communication models/ systems around knowledge bases with service providers and farmer organizations.	• Increased access to focused agricultural value chain knowledge/ information/ services.	• Extension services events completed. • Farmers participating in AGRA supported extension services. • Small packs distributed (number of small packs distributed). • Extension materials distributed (number of extension materials distributed). • Learning centers established around the demonstration plots. • Agricultural exhibitions/seed and technology fairs conducted. • Number of village-based assistants (VBAs) recruited and trained.

(d) Building inputs supply system

Skill sets required from the implementing partners	Generic description of contracted outcomes	Generic description of contracted outputs
• Experience in operating a contract farming arrangement, whereby the hub agro-dealer supplies the farmer with inputs (seed, fertilizers etc.) directly or through a retail agro-dealer and buys the farmer's outputs. • Past experience in operating a credit arrangement whereby smallholder farmers access inputs on credit and repay later. • Demonstrated experience and profitability in input systems through business streams owned within their premises (hardware, agro-vet etc.). • Inbuilt capacity to expand their businesses to provide additional services, e.g., spraying, tractor, threshing, selling of post-harvest technologies etc.	• Increased operational capacity of local input market systems. • Input distribution networks/outlets strengthened.	• Seed companies linked to agro-dealers. • Hub agro-dealers established/ strengthened. • New rural retail agro-dealers developed and supported through matching grants. • Farmer organizations accessing inputs through aggregated demand.

(e) Technology development and dissemination

Skill sets required from the implementing partners	Generic description of contracted outcomes	Generic Description of Contracted Outputs
• Capacity to do breeding. • Demonstrated experience in production of foundation seed of public varieties. • Demonstrated experience in quality and quantity early generation seed (EGS) supply.	• Increased staple crop productivity for smallholder farmers. • Increased use of inputs and other improved technology innovations.	• Breeder seeds cleaned and maintained. • Input companies responsible for production of certified seeds linked with research Institutions. • Volume of improved seed produced by supported entities. • Total number of new crop varieties promoted through national agricultural research system support. • smallholder farmers reached with target improved seeds. • Seed volume distributed for the establishment of demos.

(f) Financial services

Skill sets required from the implementing partners	Generic description of contracted outcomes	Generic description of contracted outputs
• The organization has provided/continues to provide meaningful and innovative business development service programs for more than 2 years. • The organization is widely networked; has a sufficiently wide membership and large number of young supporters in their fields of activity. • The organization must have documented management and financial systems and procedures in place, along with clear transparency and integrity in fund management.	• Increased supply of sustainable financial services. • Increased demand for financial services in focus value chains. • Increased access to agricultural information and knowledge of agriculture value chain actors.	• Financial products developed to provide financial services to smallholder farmers. • Farmer organizations linked to financial institutions and other credit facilities. • Farmers trained in financial literacy and risk management, village-based advisors identified and trained. • Trainings conducted for financial service providers. • Farmers linked to insurance providers for crop insurance. • Existing financing initiatives leveraged. • A revolving fund or a line of credit for the manufacturing and distribution of PHH technologies established. • Private sector companies investing in grain handling facilities supported by matching grants.

3. Strengthening Input and Output Market Performance in Ihemi and Ludewa SAGCOT Clusters

Rweyendela V., Rwiza S.T., Agaba E., Karuho O, Bigirwa G., Muhinda M. J.J.

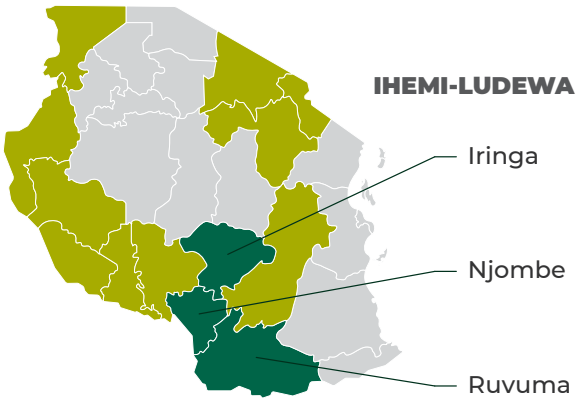
Key Messages

- Improved linkages between farmers and market actors sustained the adoption of technologies, access to input and trade finance as well as lucrative output markets.
- Leveraging existing private sector initiatives such as SAGCOT clusters catalyzed the adoption of inclusive agribusinesses.
- The consortia model reduced supply chain risks and enabled agribusinesses within the SAGCOT clusters to integrate their operations for efficiency and predictability.
- Changes in commodity export policies opened market opportunities for companies investing along the SAGCOT trade corridor.
- The participation of companies with various business lines enabled smallholder farmers under the consortium to diversify their streams of income (poultry, beekeeping, animal feeds).
- Limited capacity of off-takers (working capital and logistics) coupled with weak enforcement mechanisms for supply contracts amplified side-selling incidences.

Key Words

agricultural growth corridor, export trade, diversification, input finance, market linkages

Introduction



Value Chains

Maize Beans Soybeans

DISTRICTS

Iringa	Njombe	Ruvuma
- Kilolo	- Ludewa	- Mbinga
- Iringa Dc	- Makambako Tn	- Namtumbo
- Mufindi	- Makete	- Nyasa
- Iringa Mc	- Njombe Dc	- Songea
- Mafinga Tn	- Njombe Tn	- Songea Mc
	- Wanging'ombe	- Tunduru

Figure 11: Area covered by the Ihemi-Ludewa Consortium

The Ihemi-Ludewa Consortium brought together farmers and agribusinesses in the administrative regions of Iringa, Njombe and Ruvuma, which are part of the Southern Highlands. This zone is the "breadbasket" of the country and its neighbors. The three administrative regions occupy about 128,109 km^2 and have a combined population of 3.2 million people with an annual per-capita income of US$982 (NBS, 2017), ranking these three regions among the most prosperous in the country.

Table 2: Demographics of the target regions under Ihemi-Ludewa Consortium

Region	Actual population in 2012 populationcensus	Percentage of population growth rate per annum	Population projection for year 2020 (by NBS)	Population engaged in agriculture (crop production) by June 2019	Households engaged in agriculture (crop production) by June 2019
Iringa	941,238	2.2	1,149,481	534,945	186,204
Njombe	702,097	2.1	837,557	350,541	147,646
Ruvuma	1,376,891	2.4	1,655,443	938,126	258,005

Source: URT (2020) & NBS (2020)

In the Iringa region, agriculture is the mainstay of the economy, accounting for 85% of its GDP (Economic and Social Profiles Report, 2013). The region has a total of 220,776 households out of which 180,065 households are engaged in Agriculture (82%). Iringa has a total area of 3,574,300 hectares out of which 270,420 hectares (7.6%) occupied with water bodies and the rest 3,303,880 hectares (92.4%) is land used for various activities. Of this, 1,556,465 hectares (47.1 %) is suitable for agricultural activities. The goal of the region is to ensure citizens are self-sufficient in food production, increase income and secure access to raw materials for industry.

In the 2020/2021 season, the region cultivated a total of 419,758 hectares out of 452,552 hectares of arable land for various food crops which is equivalent to 92.8%. The total food production was 1,173,554 MT. Table 3 gives a summary of some food crops produced.

Table 3: Projected and actual production of main crops in Iringa region during 2020/2021 season

Crop	Land size (Ha)	Projected output (MT)	Actual cultivated (Ha)	Actual production (MT)
White maize	300,013	859,581	286,548	784,298
Yellow maize	211	364	154	226
Paddy	23,599	103,855	17,577	75,995
Sorghum	8,644	7,806	7,414	5,128
Wheat	4,213	9,644	1,717	3,912
Beans	86,716	104,945	81,543	97,842
Total	**423,396**	**1,086,195**	**394,953**	**967,401**

Njombe region occupies 24,994 km^2 where 84.7% is land and 15.3% is water bodies. Agriculture dominates the livelihoods and economic activities of 90% the population. Maize, beans, sunflower and irish potatoes are the main crops grown, mostly by smallholder farmers who cultivate an average area of 0.8 hectares per household (Regional Investment Guide, 2015). In the **Ruvuma region,** 76% of the population is engaged in the agriculture (crops and livestock) sector. Different crops are grown, including coffee, beans, maize, groundnuts, paddy, potatoes, tobacco, cassava, sesame, millet, coconuts, cashew nuts, sorghum, fruits and sunflower (President's Office Regional Administration and Local Government, 2019).

The Ihemi-Ludewa Consortium focused on value chains that dominate the farming system in the region including maize, beans, and soybeans, and targeted 100,000 smallholder farmers in nine districts: Iringa Rural, Kilolo, Mufindi,

Makambako, Wanging'ombe, Njombe Rural, Ludewa, Madaba and Songea Rural. These districts cover about 70% of the total area of the three regions.

The program targeted upgrading and improving linkages between market actors and smallholder farmers, as well as solving supply chain breakdowns that prevented traders and processors from operating optimally. To upgrade the supply chain management, actors adopted the following innovative and inclusive models:

- Innovative input finance.
- Access to mechanization services: Equipment lease financing and lead farmer mechanization hubs.
- Modernized off-taker-led crop production and aggregation.
- Electronic input verification platforms for quality assurance and traceability.
- Private sector-led extension through village-based advisors providing linkages to both input and output markets.
- Scaling-up the adoption of post-harvest technologies including hermetic storage solutions and mechanized threshing.

The consortium capitalized on the existing opportunities such as the agronomic conditions, increasing investment through the SAGCOT initiative, presence of several key stakeholders, off-farm infrastructure projects, potential to increase exports to neighboring countries, diversified farming systems and the production of marketable surplus.

The consortium further leveraged the following investments:

i) USAID-funded NAFAKA-II Africa Rising (AR) program which implemented projects to:
   - popularize high iron beans (the JESCA variety) through demo plots and school feeding programs.
   - improve maize and rice value chains through an ICT-based extension platform named *Mwanga*. It registered farmers via e-soko for technical and market (including cross-border trade) advice through SMS.
   - promote improved and resilient varieties of food crops (maize, rice and legumes). The project focused on expanding good agricultural practices, strengthening post-harvest handling, and improving nutrition outcomes in Iringa Region.

ii) Climate Smart Agriculture (CSA)/Super Project of Care International, the International Center for Tropical Agriculture (CIAT), Sokoine University of Agriculture (SUA) and Wageningen University, working on upscaling climate smart agriculture via microfinance. The initiative worked with village savings and loans associations (VSLAs) to enhance agricultural finance. It also used farmer field business schools to deliver agricultural knowledge to small-scale women farmers.

iii) Putting Smallholder Farmers First in the Fight to End Hunger program implemented by the One Acre Fund, which delivered tools to smallholder farmers in remote areas where yields and access to financing have lagged behind (focusing on developing asset-based input loans to smallholder farmers).

iv) SAGCOT, through its multitude of initiatives to promote private sector investment in the corridor. More specifically, the Ihemi-Ludewa Consortium collaborated closely with SAGCOT to support the soybean value chain anchor farms project.

Structure and roles of implementing partners

This consortium was made up of five partners who brought together complementary skills and had different roles and responsibilities (refer to Appendix 3.1). These implementing partners included:

a) **Tanzania Agricultural Research Institute (TARI) Uyole**, which was responsible for crop breeding and supply of early generation seed (EGS) to the seed sub-component of the consortium.

b) **Building Rural Incomes through Enterprise (BRiTEN)** that was responsible for strengthening the extension services and networks of agro-dealers. This partner mobilized relevant value chain actors, such as SMEs, hub agro-dealers, and farmer organizations to enhance the uptake of modern technologies and practices and

expand the demand for improved agricultural inputs.

c) **East Africa Grain Council (EAGC)**, which was responsible for markets and post-harvest management, equipping farmers with simple quality-control tools to support the improvement of grain quality, and refurbishing aggregation centers for use by smallholder farmers. Furthermore, EAGC was responsible for training farmers and off-takers on warehouse operations and management as well as on post-harvest management and aflatoxin control.

d) **Tanzania Association of Professional Business Development Services Providers (TAPBDS)** that was responsible for providing business development services and building appropriate systems for financing purposes for farmer organizations and linking the beneficiaries to the appropriate financing platforms. The association also built the capacity of agricultural marketing cooperatives (AMCOS), women and youth in farming as a business, record keeping, and development of financial products that are affordable and accessible to farmers and SMEs. TAPBDS also supported SMEs with business planning and capacity building on good governance and leadership skills.

e) **Local government authorities** that were responsible for:

- enabling a supportive regulatory environment with appropriate incentives for private-sector investment and inclusion of smallholders (see Chapter 9 for details).
- establishing and coordinating the stakeholders' platform and convening all partners every quarter to share results and experiences. These partners included private sector companies (input and output market players and technology manufacturers).
- providing guidance to the consortium, especially through quarterly consortia planning and review meetings (JRRC and SC). Also, the Regional Agricultural Advisors (RAAs) coordinated M&E activities each quarter to assess progress and provide guidance and direction.
- providing the focal point for coordination with authorities down to sub-village (*vitongoji*) levels.

The resident AGRA program officer was responsible for the management and supervision of all implementing partners contracted to carry out program activities. The officer was also responsible for providing technical support and monitoring activities to ensure effective implementation and reporting.

Summary of outcomes vs investment

The total direct investment for the Ihemi-Ludewa Consortium amounted to US$2,091,496 and reached 163,257 smallholder farmers. Most of these farmers adopted new technologies and practices to improve productivity, and access better markets. They also invested in improved inputs and other services related to good farming practices, and good post-harvest handling (e.g., use of tarpaulins for sun drying and hermetic bags for storage of grains). About 70% of smallholder farmers had access to assured and predictable markets.

As illustrated in Figure 12, the value leveraged from the Ihemi-Ludewa investment was nearly US$44.5 million, 21 times the program's direct investment. These investments included:

a) Modern and automated flour milling by the Njombe Region Cooperative Union.

b) 6,000 MT capacity warehouse and automated maize milling plant by the G2L company that off-takes, processes and trades in beans, rice and sunflower.

c) 10,000 MT capacity warehouse by the Super Seki company in Iringa.

d) Matiganjora AMCOS in Njombe rural and Aman AMCOS in Ludewa district in Njombe; investment in new warehouses both with the capacity to store 2,000 MT of grain worth about US$80,000 each.

e) Government investment in new grain silos (12 in Songea, Ruvuma Region and six in Makambako, Njombe Region, each with the capacity to store 3,500 MT to 4,100 MT of grain). This is a result of increased grain surpluses in the AGRA project area in Njombe, Iringa and Ruvuma.

f) Silverlands investment in AMCOS in terms of input loans (seed) – from nine in 2018 to 28 AMCOS in 2020. The

company distributed 221 MT of seed in two seasons worth US$240,217.

g) Farmers' willingness to invest in inputs and post-harvest technologies.

Value leveraged by the Ihemi-Ludewa Consortium

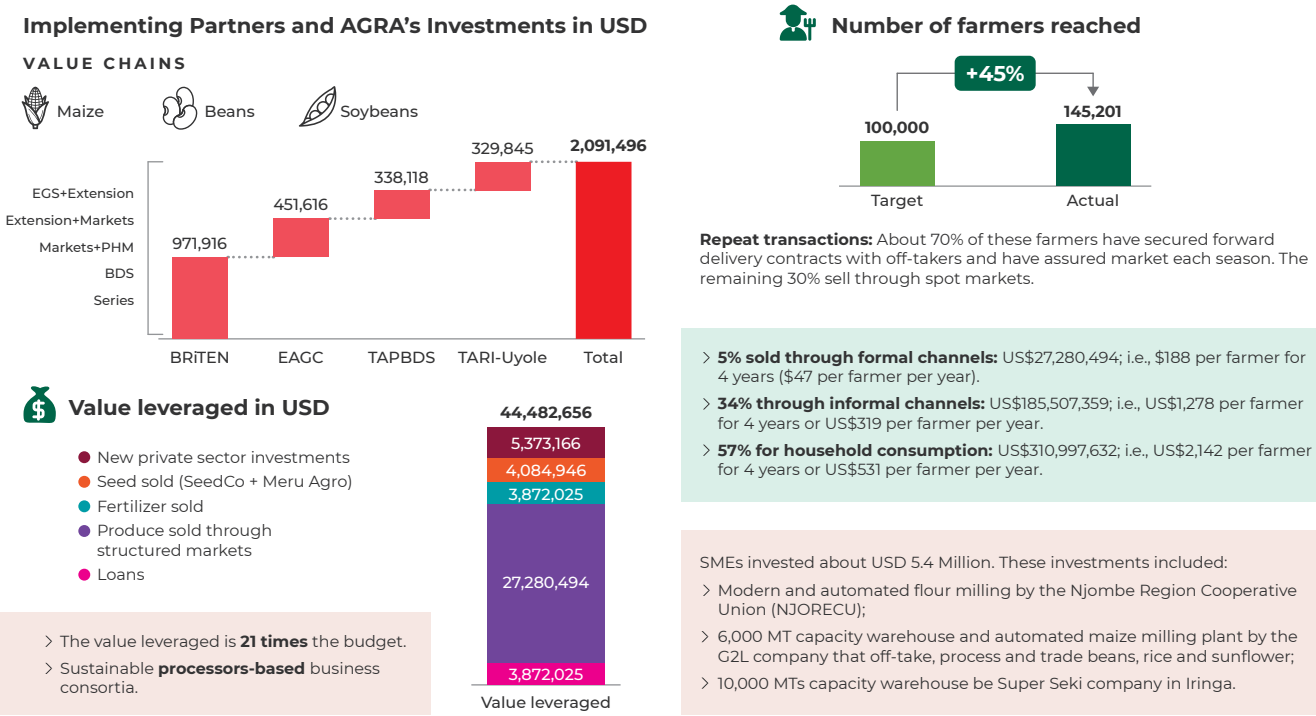


Figure 12: Value leveraged by the Ihemi-Ludewa Consortium

Sustainability through Business Sub-Consortia

The Ihemi-Ludewa Consortium created five strong business sub-consortia that are sustainable and scalable. A win-win situation was created through linkages among private sector companies operating along key value chains. They have been engaged in repeat transactions for more than three farming seasons. Due to access to reliable markets, innovative input finance products and improved extension services, farmers adopted improved inputs that enable them to continuously increase yields and incomes. This increased the demand for yield-enhancing technologies that led to increased sales and investments. Now, traders and processors can access high-quality grain and deliver products that meet consumer tastes and preferences to end markets. Figure 13 illustrates some of the sub-consortia showing how these business partners work together.

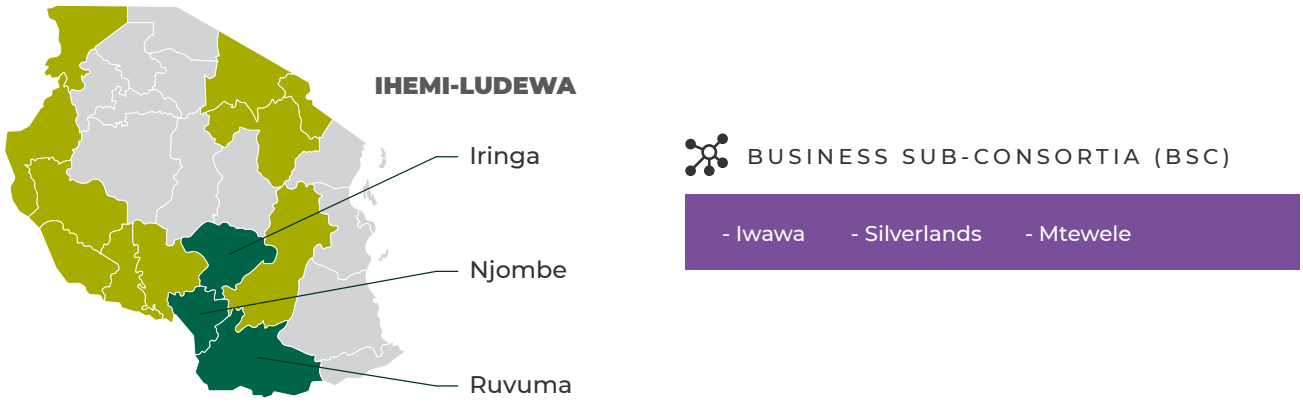


Figure 13: Business Sub-consortia (BSC) under the Ihemi-Ludawa consortium

Iwawa Business Sub-Consortium

This business sub-consortium (BSC) was led by Iwawa Agrovet, a thriving hub agro-dealer in Iringa Municipality. Started in 2008, the business had a capacity to stock inputs worth almost US$2 million annually. At first, the company used to serve only walk-in customers, leading to a very limited market size. As part of the consortium, Iwawa Agrovet was able to develop and build strong relationships with retail agro-dealers, who themselves used the consortium platform to establish an expanded market by dealing directly with farmers and/or through VBAs.

The consortium expanded the market demand for inputs through its demonstrations and awareness raising activities in partnership with the suppliers of inputs. This created a feedback loop that drove the investment and growth of the supply systems. Iwawa Agrovet established a sustainable business partnership with three retail agro-dealers and 25 local distributors, including VBAs. Thus, through working with the agribusiness consortia program, Iwawa and its partners drove and responded to demand from smallholder farmers who were well connected to the markets by the BSC. As illustrated in Figure 14, this sub-consortium also included one other hub agro-dealer, 13 input manufacturers, 25 retail agro-dealers, 15 VBAs (also in selling inputs), 27,500 smallholder farmers and five off-takers/processors with good access to markets.

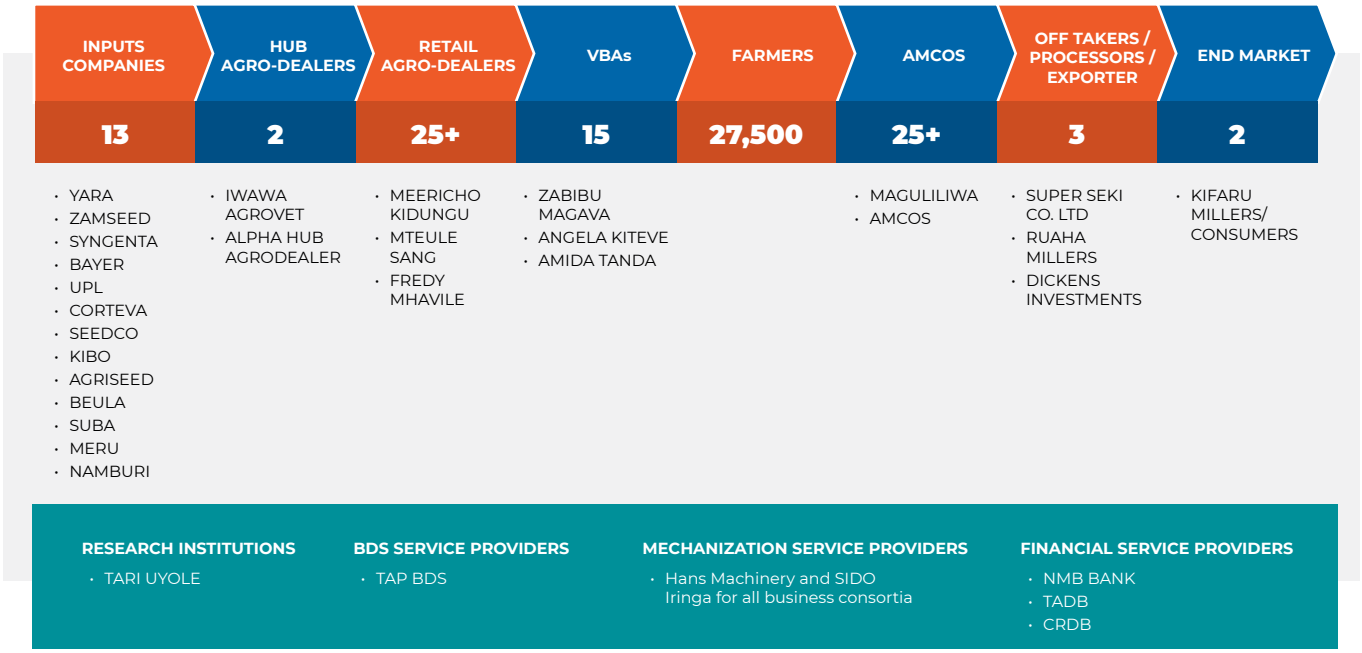


Figure 14: Members and partners of the Iwawa BSC

Input suppliers

- Multinational large suppliers such as Yara, SeedCo, Syngenta, Corteva, and Monsanto/Bayer.
- Local seed companies such as Kibo, Western Seed, Zamseed, Beula Seed, Suba Agro, Meru Agro, Agriseed, Mashamba and Tractors, Highland Seed, and Namburi Seed.
- A hub agro-dealer and several retail agro-dealers, including Alpha AgroVet and 25 retail agro-dealers.

Extension service providers

These included VBAs, retail agro-dealers and government extension agents.

Farmers

During the period, the BSC served about 27,500 smallholder farmers in Iringa Region, from 15 wards: Ihimbo, Ibumu, Mtitu, Uhambingeto, Ukumbi (Kilolo District); Ifunda, Magulilwa, Mgama, Nduli, Nzihi (Iringa Rural District);

Mtambula, Isalavanu, Itanddula, Mbalamaziwa and Igomaa Saadan (Mufindi District). Most of these farmers had forward delivery contracts with Super Seki, Ruaha and Dickens Investment.

Off-takers

On the off-take and marketing side, the members of the BSC included:

a) Super Seki, a processor with the capacity to stock 3,000 MT of grain per year. The company processes fortified flour, which it sells in Iringa, Morogoro, Mtwara, Dar es Salaam and in Kenya. For the export market in Kenya, the company secured a forward delivery agreement to deliver 400 MT/month of fortified flour to Kifaru Millers in Nairobi, an agreement facilitated by the Ihemi-Ludewa Consortium through a business to business (B2B) meeting held in Nairobi in 2018. Super Seki also has a maize bran line as a by-product.

b) Ruaha Milling has the capacity to buy about 10,000 MT/year of grain and process it into fortified flour. It mostly sells its product within the country. The company also had a forward delivery contract with WFP to deliver 20,000 MT/year.

c) Dickens Investment has the capacity to buy 2,000 MT of maize/year and a forward delivery contract to a regional market in Nairobi, Kenya, to deliver 2,000 MT/year.

These companies significantly increased the quantities of grain that they purchased from smallholder farmers as indicated in Table 4.

Table 4: Grain quantities bought before and after AGRA intervention

Name of off-taker/processor	Before (2016/2017)	After (2019/2020)
Super Seki	1,000	2,500
Ruaha Milling	650	1,500
Dickens Investment	1,000	2,000

In terms of the path to sustainability, there are indications that this BSC is sustainable:

a) Farmers are re-investing profits in purchasing improved inputs and diversifying into high-value crops, for example, green peas, round potato, and poultry.

b) Forward delivery contracts that farmers secured from Super Seki, Dickens Investments and Ruaha Milling attract other players like financial institutions who finance farmers' inputs. Seed companies also extend input loans to farmers because they are confident of repayment after crops are sold to off-takers. Table 5 provides a list of some of the financial institutions that give loans to farmers and SMEs. Most of these loans are for input finance and working capital to buy farmers' produce.

Table 5: Access to finance by farmer organizations and SMEs during consortia implementation (2017-2019)

Farmer group/SMEs	Loan amount (US $)	Financial institutions
Mshikamano Group, Kilolo Iringa	7,392	MUCOBA Bank
Kiwama Group, Madaba Ruvuma	1,634,783	Tanzania Agricultural Development Bank
Njombe Region Cooperative Union	2,173,913	National Microfinance Bank
Dickens investment (off-taker)	10,870	Access Bank
Goliath Chengula (village agro-dealer, Njombe Rural)	4,348	TPB Bank Plc[6]

6 Currently known as Tanzania Commercial Bank (TCB)

Farmer group/SMEs	Loan amount (US $)	Financial institutions
Mgeni Agro	8,696	TPB Bank Plc
Jakline Agrovet	4,348	CRDB

c) Input and output market players are expanding and investing in new warehouses at the local level and hiring more staff who are stationed locally, indicating long-term commitment. These include large input companies like Yara, SeedCo, Syngenta, Pannar, Corteva, UPL, OCP and Monsanto/Bayer, and local ones such as Minjingu, ETG, Premium, Beula, Suba Agro, Meru, Mashamba and Tractors, Agriseed and Zamseed. The companies have established branches at district and/or ward level.

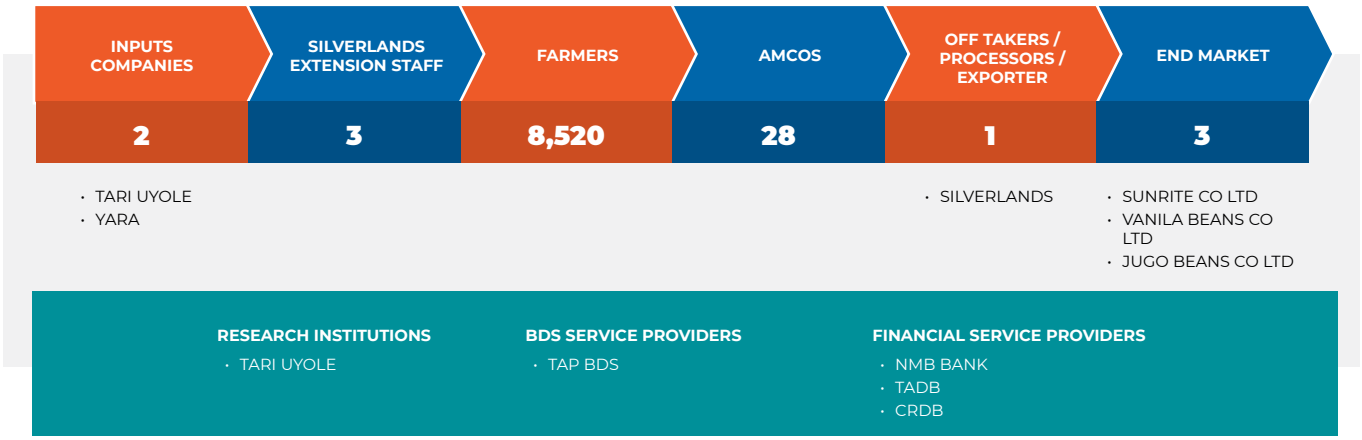
d) Input companies are investing in soil testing to enable them produce area specific inputs. For example, Yara Tanzania and TARI Uyole, have signed a soil testing agreement that is geared towards increasing the use of soil specific blended fertilizers.

Silverlands Business Sub-Consortium

This was a market led BSC anchored on Silverlands PLC, a large animal feed manufacturer and exporter of red-kidney and sugar beans to South Africa. The company had the capacity to buy about 10,000 MT of beans per year. Demand for the export market in South Africa was over 10,000 MT. Towards the end of 2018, the Ihemi-Ludewa Consortium worked with Silverlands to engage and build capacity among smallholder farmers to produce the type and quality of beans demanded by the market. Fifteen AMCOS with a combined membership of 4,520 farmers from Njombe and Ruvuma regions were members during the implementation period.

A total 113 MT of quality beans seed was supplied to farmers on credit to kick-start the production. A total of 2,260 MT of beans of the right quality was delivered by the farmers in the first season of the partnership, earning the farmers about US$1.2 million, a gross income of about US$263/farmer. In 2020, 13 more AMCOS joined the partnership bringing the total number of smallholder farmers to more than 8,000. Volumes for the market in the 2020 season amounted to about 4,000 MT worth US$782,605.

Figure 15: illustrates members and partners of the Silverlands SBC



As illustrated in Figure 15, this SBC included the following key players:

Input suppliers

Partners included one multinational, Yara Tanzania Ltd, already described in previous sections. TARI Uyole, with a capacity to produce 450 MT of quality declared seed (QDS) of beans per year, was in charge of providing the early generation seed (EGS). In 2020, TARI Uyole produced 74 MT of EGS that was sold to seed companies for multiplication. Seed companies multiplied and sold 414 MT of QDS in 2020 to agro-dealers and farmers. It should be noted that the production was demand driven; the Institute can produce more if needed.

Extension services providers

Silverlands supported extension through nine field staff members stationed in Makota village in Iringa and in Ndolela village in Songea. Their responsibilities included training farmers on improved agricultural methods/conservation farming through demonstration plots and field days, and monitoring demonstration and crop aggregation. In 2019, the field officers worked closely with 15 contracted AMCOS in Iringa, Njombe and Ruvuma. The number increased to 28 AMCOS in 2020.

Farmers

The BSC worked with 8,520 farmers in Iringa, Njombe and Ruvuma regions, who were members of 28 AMCOS. These AMCOS had forward delivery contracts to supply beans to Silverlands.

There are good indications that **this BSC is sustainable** as more AMCOS are applying to join it driven by profit motives, while the main buyer is fully committed to procurement from smallholder farmers and has set up a fully-fledged unit with nine staff members to manage its outreach.

Mtewele Business Sub-Consortium

This BSC was anchored on Mtewele General Supply, a hub agro-dealer in Njombe town with the capacity to stock inputs worth over US$2 million annually. The company had five outlets in different regions in the Southern Highlands and a network of over 50 retail agro-dealers. The Ihemi-Ludewa Consortium enabled the company to engage 35 VBAs, who became distributors for the company in their respective villages as well as agents who collected input orders from farmers.

For example, Goliath Chengula, a VBA in Njombe Rural, delivered 92.5 MT of fertilizer, 2.1 MT of seed, 101 liters of herbicides/pesticides, 180 liters of booster and 500 hermetic bags during the 2019/2020 season. The company delivered the inputs to farmers with 50% of the cost as a loan to be paid after harvesting and marketing.

Table 6: Seed and fertilizer sold by Mtewele BSC by year

Year	Seed sold (MT)	Fertilizer sold (MT)
2018	81.8	6,660
2019	120	13,300
2020	250	13,800

In collaboration with the retail agro-dealers and VBAs, the company took over farmer training, which was originally provided by the implementing partners in the consortium. When asked how this BSC was performing, the CEO of Mtewele replied: “We have seen great changes and profits because of big consignments sold and the presence of stable markets and a good business environment between us and the farmers”. Other partners in the BSC, are as illustrated in Figure 16.

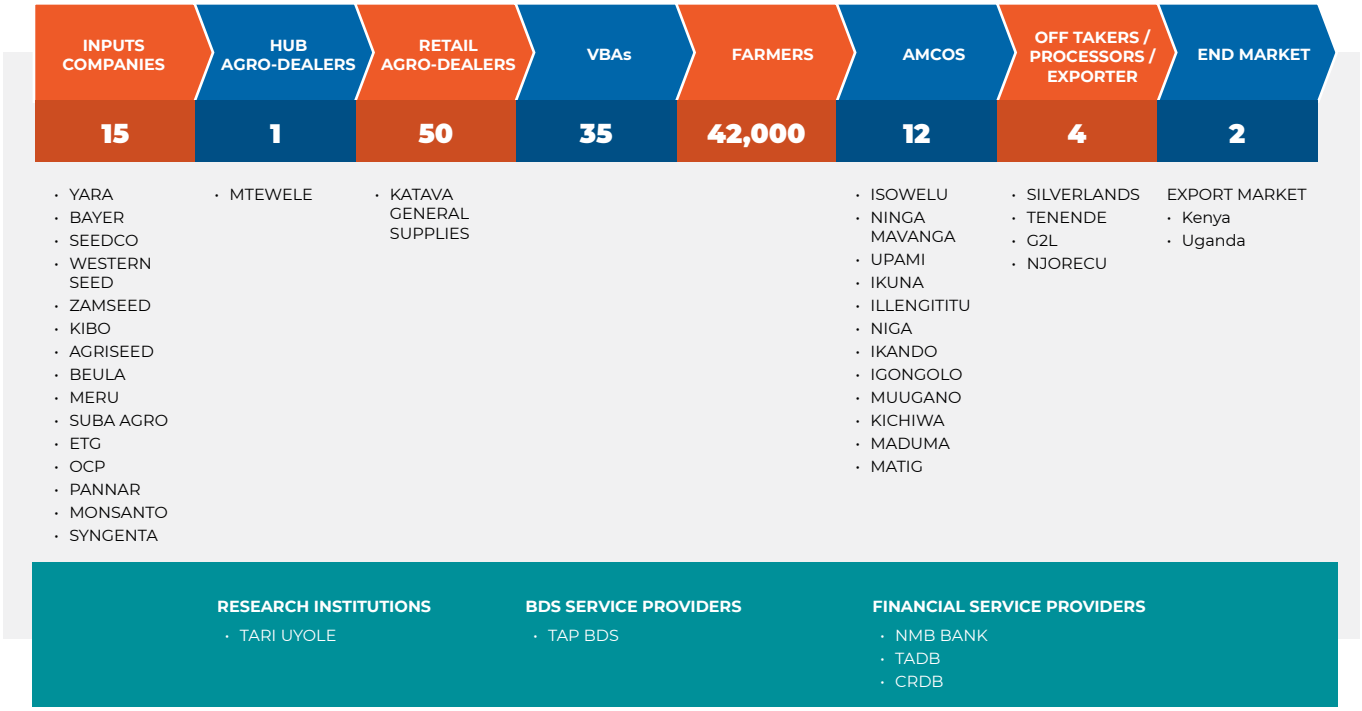


Figure 16: Members and partners of the Mtewele BSC

Input suppliers

Partners within this BSC included eight multinational and seven national companies linked to the main buyer from farmers – Silverlands PLC – which also served as a contract seed farmer for the seed companies. About 50 retail agro-dealers ensured smallholder farmers have access to high quality inputs within a range of five kilometers. This critical mass of input suppliers was a major outcome of the consortium, lowering transaction costs and increasing the choice of inputs for farmers.

Extension service providers

Agro-dealers provide valuable extension services in addition to providing training and affordable, no-collateral credit to farmers, an indication of high levels of trust and strengthened business relationships.

There were 35 VBAs that were potentially viable enterprises given that they doubled-up as small-scale agro-dealers and local distributors, each serving a minimum of 200 farmers and with the capacity to distribute inputs worth US$15,000 each year.

> “We have good knowledge of not just fertilizer use, but we also advise our clients on other agronomic practices like land preparation, planting time, type of seeds suitable for a particular location, types and use of herbicides, pesticides and plant spacing. In fact, we work as extension officers since we have basic knowledge in agriculture that is satisfactory to our customers.”
>
> **Rodrick Kibiki, Ilengititu village in Njombe Rural**

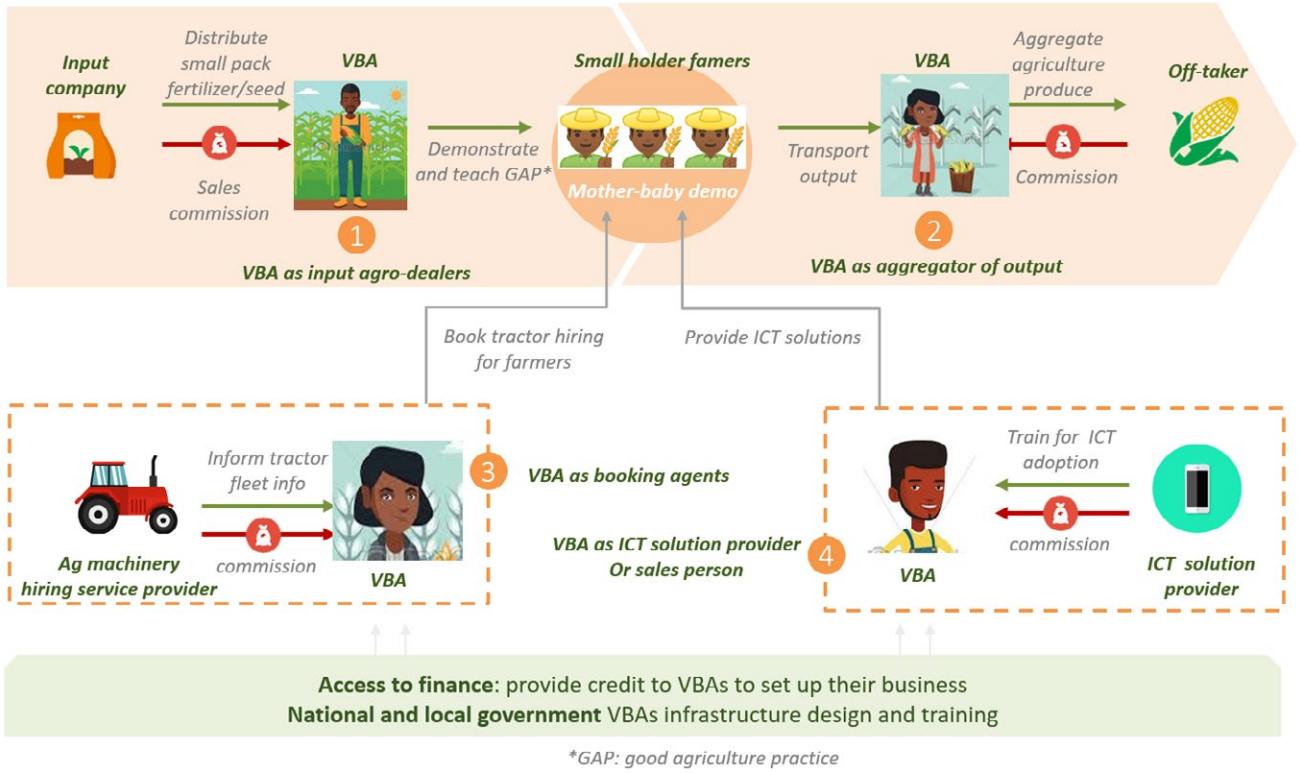


Figure 17: The roles VBAs can play in the agriculture value chain

Farmers

This BSC had a membership of about 42,000 smallholder farmers grouped into 50 AMCOS in Njombe Rural, Makambako, Wanging'ombe, Ludewa, Madaba and Songea districts in the Njombe and Ruvuma regions.

Off-takers

The BSC involved three key buyers:

a) Silverlands Plc provided a guaranteed market for maize and soybeans for the manufacture of poultry feeds. Farmers that sold to Silverlands were integrated in the poultry value chain. These farmers bought day-old chicks and poultry feeds from Silverlands within a symbiotic business relationship, enabling farmers to diversify into high labor productivity ventures. Silverlands ran a poultry feeds plant with a capacity of 40 MT/ hour and silo storage capacity of 32,000 MT. In 2019, the company purchased 20,000 MT of maize from 9,200 contracted farmers and 3,000 MT of soybeans from 4,000 smallholder farmers.

b) Tenende had the capacity to buy 1,500 MT of maize per year. The company processed maize flour and sold it within Njombe and neighboring regions. in 2019/2020, Tenende bought 1,300 MT of maize from about 6,500 smallholder farmers. This volume is 2.6 times what the company used to buy before joining the BSC.

c) Njombe Regional Cooperative Union, with a capacity to buy and process 6,000MT of maize per year for the local market.

The following dynamics demonstrate sustainability potential for the BSC:

a) Inclusive input supply chain: The anchor firm, Mtewele General Trader provides supply chain finance and logistics support to agro-dealers who also work with VBAs as last mile delivery agents.

b) The large investment in silos, warehouses and agro-processing capacity.

c) Increased farmers' ability to invest in more farm inputs and other productive assets.

d) Well-coordinated input and output markets: Private sector companies dealing in inputs and traders and processors regularly attend pre-and post-season coordination meetings.

AGRA investments in the following areas enabled a transition from a consortium facilitated by non-profit organizations to multiple business groupings transacting among themselves:

a) Improved technology development (new crop varieties, breeder/early generation seed and QDS).

b) Creation of demand for new technologies.

c) Strengthening input distribution network (agro-dealer development/VBAs).

d) Unlocking market opportunities through business to business (B2B) forums and post-harvest management.

e) Efficient smallholder grain marketing systems.

f) De-risking some financial institutions through revolving funds.

g) Real-time, on-the-ground intelligence and insights that made it possible for the organization to understand the status of activities, farmer realities, and new opportunities to improve their lives and accelerate progress towards transformation.

Box 1: Rodrick Kibiki, Ilengititu village, Njombe




Mr. Rodrick Kibiki was selected by his fellow villagers to become a VBA in November 2017. He was taken through refresher training on good agricultural practices and post-harvest handling, with additional training in entrepreneurship. He was also trained by Tanzania Official Seed Certification Institute (TOSCI), Tanzania Fertilizer Regulatory Authority (TFRA) and Tanzania Pesticide Research Institute (TPRI) on inputs policies. After a business-to-business meeting held in early 2018, Rodrick established strong partnerships with inputs and output market players. Previously, farmers in Ilengititu village experienced challenges accessing inputs because they were forced to travel 35 km to Njombe town for them. Rodrick saw an opportunity and established a small agro-dealership in his village using TZS1.5 million (~US$648) saved from the sale of crops. This amount was matched with a US$1,000 grant from the Ihemi-Ludewa Consortium. Rodrick bought his first consignment of inputs from Mtewele in Njombe town and was supported to register his business. During the 2018/2019 season, Rodrick served 800 farmers.

The VBA continued working and building good relationships with hub/retail agro-dealers and input companies who, from the relationship of trust, particularly with Mtewele General Traders, supplied him with inputs on credit, resulting in increased working capital of about TZS12 million (~US$5,175) reaching more than 1,780 smallholder farmers with inputs valued at over TZS9 million (~US$3,891). The presence of Rodrick's agro-shop in his village and a few other neighboring villages reduced the distance between farmers and inputs by between 80% and 95%.

During the 2019/2020 season, Rodrick bought a manual planter with the capacity to plant three acres per day and a sprayer from the profits of his farming and agro-dealership business. He offered planting and spraying services to farmers in his village at TZS25,000 (~US$10.78) and TZS5,000 (~US$ 2.16) per acre, respectively, serving 60 farmers during the season, with planting and spraying services covering a total of 85 acres.

The VBA also acquired a maize shelling machine. During the 2019/2020, he served about 200 smallholder farmers and shelled 5,000 bags of 100 kg capacity. His machine has a capacity to thresh and blow 10.8 bags per hour at TZS1,000/bag (~US$0.4). With support from the Ihemi-Ludewa Consortium, Rodrick submitted a request to TPB to become the bank's agent in his village, which that would him and farmers the 35 km journey to Njombe town for banking services. He also started telecom services (Mpesa, Tigo pesa, Airtel money) in his village. He is expanding and his business is growing.

As he expands his services, Rodrick's quality of life has improved and the farmers he serves have also expressed their satisfaction at his effectiveness and efficiency.

Weaknesses and Opportunities for Improvement

- The original intention of bringing in NGOs was to facilitate coordination among the market actors in the Ihemi-Ludewa cluster. However, it was difficult to find a non-profit organization with a comprehensive understanding of agricultural market systems. Therefore, many NGOs were brought on board to support key components (seed, fertilizer, extension, markets, finance). This resulted in duplication and a focus on service delivery rather than strengthening the agribusiness coordination mechanism. As a result, BSC were initiated very late in the implementation. Development programs should therefore involve more agribusinesses in their initiatives to achieve transformation within a short period of time.
- Maize was the most widely produced crop for both subsistence and sale in the Ihemi and Ludewa SAGCOT clusters. The maize industry is dominated by informal buyers, and it is difficult to establish trust-based relationships between farmers and trusted markets. Multiple marketing channels for maize in this consortium increased the risk of farmers selling through different channels while in some cases, buyers also failed to meet the agreed floor-price citing market volatility. Farmers also failed to deliver the agreed crop volumes citing production challenges. Overall, price fluctuations made it difficult for each party to stick to agreed terms. As both parties operate in a rapidly changing market environment, prices and volume obligations stated in the contract should be adjustable downwards and upwards to be in sync with market dynamics.
- The design of the Ihemi-Ludewa Consortium did not take into consideration the role of agri-food industry associations. Even though business sub-consortia offer a path to sustainability, partnering with these associations would be an effective exit strategy as they would continue facilitating transactions among consortia members at scale.

Conclusion

The Ihemi-Ludewa Consortium provided a platform for increasing private sector investment in the areas of input distribution, storage, aggregation centers and processing facilities. This consortium also enabled the private sector to effectively capitalize on complimentary public infrastructure (new roads, electricity lines) that support the modernization of the agri-food industry in the Iringa, Njombe and Ruvuma regions. The most impactful interventions included developing a network of traders, processors and producers as well as financial institutions, and technology manufacturers, leading to the creation of a sub-consortia of business operators including farmers. These are self-propelled business relationships that are not dependent on external facilitation.

To further strengthen the Ihemi-Ludewa Consortium, stakeholders should increase investments in areas such as product development and marketing, processing capacity, and quality standards.

Any government or development partner willing to replicate this approach, needs to start with a strong analysis of issues facing actors in input and output markets. This may include access to finance and larger markets, improved technologies, enabling policy environment and price discovery mechanisms.

However, the selection of entry points is a crucial step in the development of such agribusiness partnerships. The use of multiple NGOs slowed down the establishment of self-sustaining business sub-consortia.

Acknowledgements

The authors acknowledge the technical support provided by implementing partners such as BRiTEN, TARI Uyole, EAGC and TAPBDS. The implementation of the Ihemi-Ludewa Consortium would not have been successful without the coordination of and supervision support from the regional secretariats of Iringa, Njombe and Ruvuma. We sincerely acknowledge the role played by the private sector partners, among them input companies, processors and off-takers, mechanization service providers and financial institutions, as well as participating farmers.

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Annex 3.1: Ongoing Work in the Ihemi-Ludewa Cluster

Partner	Name of partner's project	Value chain and aspect being addressed	Organization implementing the project	Remarks
USAID	NAFAKA II	Maize and rice Markets. Collaborated with them in extension, particularly field days	ACDI/VOCA	A 5-year project started in 2016, working with 30,000 farmers in Mbeya and Iringa
USAID	Mboga na Matunda	Horticulture Nutrition Third season program for our farmers	Fintrac, Tanzania Horticulture Association	A 5-year project started in 2017, working with 50,000 farmers in Iringa, Morogoro, Mbeya, Songwe and Zanzibar
Care International (with support from Australian Aid)	Growing is Learning	Soybean value chain Extension, Nutrition Collaborated with them in extension, particularly during field days	Women and Poverty Alleviation in Tanzania and Tanzania Grassroots oriented Development	A 4-year program started in 2017 working with 3,825 farmers directly and another 13,200 indirectly in 15 villages in Iringa
Clinton Development Initiative (CDI)	Anchor Farm Project	Soybean Extension Our farmers are also beneficiaries as seed multipliers	Clinton Development Initiative	CDI works with nearly 6,000 smallholder farmers in Iringa Rural
The MasterCard Foundation, Bill & Melinda Gates Foundation, and the Swedish Postcode Lottery	Asset-based loans, input delivery, crop storage solutions	Maize Invest in farmers to generate a gain in farm income through input loans	One Acre Fund	Started working in Tanzania in 2013; works with 50,000 farmers across the country
Governments of Denmark, Ireland, Sweden and Switzerland	Post-harvest loss reduction	Maize Markets (improved support functions, rules and policies) Leveraged their investment in Wanging'ombe by moving away from maize and BRiTEN used Agricultural Markets Development Trust (AMDT) money to support farmers	AMDT through BRiTEN, Rural and Urban Development Initiative (RUDI)	Started working in 2018/2019. The duration is three years

Annex 3.2: Structure and Roles of Implementing Partners in Ihemi-Ludewa

Value Chain component	IP member and key skill sets	Contracted outcomes	Contracted outputs
Markets and trade	EAGC: An organization whose operations span over 10 countries in Africa with 450 members and experience serving 2.5 million smallholder farmers. The organization has: • ability to build commercial linkages of smallholder farmers to markets • ability to build strong and inclusive value chains • experience in analysis of markets and trade • a track record in developing trading systems and capabilities of farmers and SMEs • ability to implement "reverse extension", to drive decisions and capacity of farmers as well as inputs suppliers to adequately respond to market needs	• Reduced post-harvest losses • Increased use of structured markets • Strengthened public-private partnerships in agriculture	• 80% increase in aflatoxin control and use of post-harvest technologies • 165,956 MT of crops sold through structured markets • 70,922 farmers selling through structured markets • MoUs between the consortium and local government signed. Enhanced partnerships between farmers, input companies, off-takers/processors, government and financial service providers • 95 formal business agreements among value chain actors secured
Primary handling and aggregation	EAGC as above	• Increased use of structured markets • Reduced post-harvest loss	• 147,200 MT aggregated • 70,922 farmers aggregated crops for collective marketing • 15 warehouses refurbished, 2 under construction • Equipped 15 warehouses with post-harvest handling equipment • 18 moisture meters • 15 weighing scales • 30 tarpaulins • 15 manual sieves • 250 pallets • 70,520 farmers trained on post-harvest management

Value Chain component	IP member and key skill sets	Contracted outcomes	Contracted outputs
Modernizing farming for smallholder farmers	Building Rural Incomes Through Enterprise (BRiTEN) have experience in: • agribusiness development and competitiveness • increasing agricultural productivity and access to inputs • agro-dealer development • development of information and extension delivery models • Building synergies among actors	• Increased adoption of agriculture enhancing technologies	• 107,200 baby demos planted against the target of 100,000 • 1,158 mother demos for maize, beans and soybean established • 70% of farmers in the project area use agriculture enhancing technologies • 1,020 extension events — demos, field days, ICT programs, agricultural shows conducted • 80,968 farmers reached by extension • 291 agro-dealers supported and are working with farmers
Building inputs supply system	BRiTEN have experience in: • agribusiness development and competitiveness • increasing agricultural productivity and access to inputs • agro dealer development • development of information and extension delivery models • building synergies among actors	• Strengthened agricultural input systems technology development and supply chains • Strengthened capacity for farmer organizations and other agricultural value chain actors in focus	• 146,201 farmers (102,332 male, 43,869 female) are accessing inputs through aggregated demand • 291 agro-dealers trained on business skills for efficient distribution of inputs to farmers. • 12 seed companies and 5 fertilizer companies are in partnership with agro-dealers • 829 VBA trained and supported
Technology development and dissemination	TARI is a research institute under the Ministry of Agriculture responsible for all agricultural research activities conducted by the national agricultural research system in the country. The research institute has: • capacity to do seed breeding and multiplication of focus crops (maize, beans and soybean) • experience in production of foundation seed • demonstrated past experience in quality and quantity EGS supply	• Increased adoption of agricultural enhancing technologies • Reduced impact of agricultural volatility	• 39 MT of maize, beans and soybean breeder seeds multiplied and maintained for further multiplication at TARI station and by other seed companies • 2,625.5 MT of QDS sold to farmers • 12,963.6 MT of fertilizer distributed • 3,227.6 liters of pesticides and 15,040 liters of herbicides sold

Value Chain component	IP member and key skill sets	Contracted outcomes	Contracted outputs
Cross-cutting services: BDS, finance, and policy	TAPBDS is a Tanzanian youths-based organization responsible for promoting business development skills that include capacity building, business management, financial management skills, youth and women development skills, governance, enterprise establishment and growth, linkages, negotiation skills, marketing skills, resources management skills	• Strengthened and expanded business development, financial and risk management, services in the focus value chains • Reduced impact of agricultural volatility • Strengthened capacity for farmers and other agricultural value chain actors in focus • Increased youth and women empowerment and livelihoods in agriculture • Increased agricultural employment and entrepreneurship	• 166 farmer organizations strengthened in financial management and record keeping • 38 women-owned enterprises supported in the value chains and accessing financial services • 177 youth-owned enterprises supported and receiving financial services • 354 jobs created • US$519,216.38 in loans disbursed to farmer organizations and SMEs

4. Strengthening Technology Adoption for Increased Productivity, Quality, and Commodity Trade in Rukwa and Katavi Regions

Laizer J., Karuho, O., Agaba E., Muhinda M. J.J.

Key Messages

- Quality improvement was the main focus of the Sumbawanga-Katavi Consortium as the farmers' produce was missing out on cross-border markets due to superior quality from neighboring countries. The consortium supported the manufacturers of quality enhancing technologies and linked them to farmers, financial institutions, and service providers.
- Prior to the existence of this consortium, only a few companies supplied improved seed to the regions, limiting farmers choices. When various agribusinesses started working together, more opportunities were created, attracting more input companies.
- To derisk private sector investments in market infrastructure, AGRA deployed a matching grant facility for the construction and rehabilitation of warehouses, and acquisition of processing technologies.
- Lead firms such as Africa Improved Foods (AIF), which is based in Rwanda, contributed towards improving the value chain governance by adopting a pricing model that paid for quality. This incentivised farmers and other grain handlers to improve the quality of commodities produced in the two regions.
- Improved access to export markets for traders and processors led to increased commercialization of maize and rice value chains in Rukwa and Katavi regions.
- Access to finance remained a major limiting factor, preventing actors within the consortium from taking full advantage of business relationships and related transactions.

Key Words

technology adoption, post-harvest management, value chain governance, cross-border trade, market infrastructure

Introduction

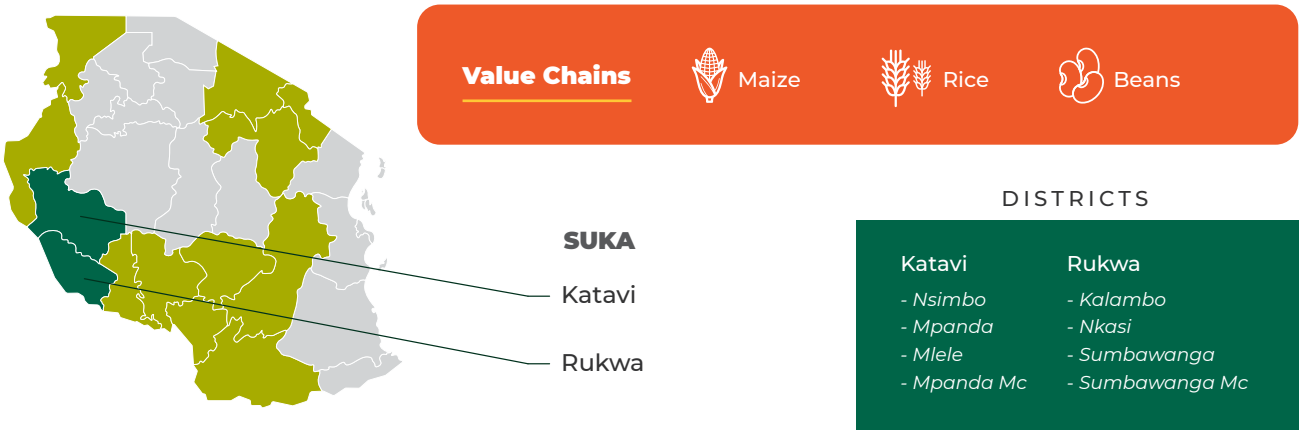


Figure 18: Area covered by the Sumbawanga-Katavi Consortium

The Sumbawanga-Katavi (SUKA) Consortium is among the SAGCOT priority clusters situated along major trade corridors with proximity to markets in the DRC and Zambia. The SUKA regions have large areas of arable land suitable for developing irrigation schemes, especially for rice cultivation. The region's priorities are consistent with national strategies and goals for transforming the economy into a middle-income and semi-industrialized economy by 2025 (Katavi Region Investment Guide, 2019).

The administrative regions of Sumbawanga and Katavi occupy about 73,608 km^2 and have a combined population of 2,075,936 of which, 37% are engaged in agriculture. Of the total number of households engaged in agriculture in these two regions (309,978), 44% (136,748) were reached through consortia interventions.

Table 7: Demographic summary of the regions on selected parameters

Region	Land size (km2)	Arable land (ha)	Population estimate (2020)	Annual growth rate (projected)	Population engaging in agriculture in 2019	Number of households engaging in agriculture 2019	Farming households reached through the consortia
Rukwa	27,765	1,660,600	1,270,049	3.1	776,691	203,100	82,048
Katavi	45,843	4,586,355	805,887	4.5	463.014	106,878	54,700

Source: URT (2020) & AGRA (2020)

Agriculture is the main economic activity for both regions, and it is estimated that the livelihoods of more than 90% of the population depends on agriculture and livestock. Staples crops include beans, maize and rice. Other priority crops are cassava, finger millet, groundnuts, potatoes, sorghum, sugarcane and wheat (Katavi and Rukwa Investment Guide, 2020/2019). Table 8 shows the production of three crops over the years.

Table 8: Maize, beans and rice production over the years

	2015/2016		2016/2017		2017/2018		2019/2020	
Value chains	Area (Ha)	Production (MT)	Area (Ha)	Production (MT)	Area (Ha)	Production (MT)	Area (Ha)	Production (MT)
Rukwa Region								
Maize	236,674	566,206	264,554	710,602	222,829	463,305	239,603	585,723
Rice	38,808	111,697	28,778	55,631	44,032	135,991	31,165	61,491

	2015/2016		2016/2017		2017/2018		2019/2020	
Value chains	Area (Ha)	Production (MT)	Area (Ha)	Production (MT)	Area (Ha)	Production (MT)	Area (Ha)	Production (MT)
Beans	106,329	134,693	109,726	131,838	122,709	140,114	122,609	121,686
Total	**381,810**	**812,596**	**403,058**	**898,071**	**389,569**	**739,410**	**393,377**	**768,901**
Katavi Region								
Maize	107,121	288,620	140,304	439,599	147,971	357,876	118,192	337,943
Rice	53,609	200,157	50,451	204,990	81,398	316,631	105,402	389,751
Beans	12,070	17,034	17,650	27,159	30,959	39,270	12,709	18,981
Total	**172,800**	**505,811**	**208,404**	**671,748**	**260,328**	**713,777**	**236,303**	**746,675**

Source: URT (2020

Consistent with the national priorities, the Katavi and Rukwa Investment Guide highlights the participation of the private sector in spurring economic growth and job creation through a semi-industrialized economy. The SUKA consortium responded positively to these priorities by bringing together various stakeholders, including private sector and non-state actors to build an ecosystem around smallholder farmers who are the main producers of staple crops. The key objectives of this consortium were:

- To improve access to inputs and output markets for at least 40% of the farming households in Katavi and Rukwa and to improve their productivity.
- To enhance the capacity of grain traders and processors to access larger domestic and regional markets and build inclusive supply chains in Rukwa and Katavi.

To support local government to better coordinate investments, the SUKA Consortium kickstarted regional agricultural stakeholder platforms. These were sub-national working groups that provided a platform for public-private dialogues.

The consortium specifically targeted Katavi and Rukwa regions, which in the past had limited investments due to poor road access and a limited pool of investment funds. Some donor supported programs focused on health and environment, among the few that supported agriculture were:

a) Empowering Women Smallholder Farmers in the Rice Value Chain in Tanzania, funded by Comic Relief.

b) Opportunities for Youth Employment, funded by the Mastercard Foundation.

c) Sustainability and Inclusion Strategy for Growth Corridors in Africa (SUSTAIN-Africa), funded by the International Union for Conservation of Nature (IUCN).

The SUKA Consortium leveraged these existing programs to amplify its impact and reach more farmers with improved agricultural technology (both yield-enhancing and post-harvest loss reducing technologies), finance, and markets.

Organizational structure and roles of implementing partners

The consortium promoted a market-led approach integrated with value chain governance to improve the profitability of the beans, maize and rice value chains. The project aimed to improve the livelihoods of farmers through adaptive capacities and market-led agricultural production of grains, and by reducing shocks and stress across the region.

AGRA put together a multidisciplinary consortium of partners with expertise in production, markets, post-harvest management, agriculture finance, and mechanization. The SUKA Consortium comprised four implementing partners with designated roles and responsibilities:

- **Agricultural Council of Tanzania (ACT)** from Katavi Region was the lead partner responsible for strengthening market-led interventions, financial and business development services, warehouse management and post-harvest reduction related interventions.

- **Action for Development Programs (ADP Mbozi)** in Katavi Region was in-charge of extension, agro-dealerships, capacity building for leadership and decision-making, and youth and women empowerment.
- **Mbozi-Ileje-Isangati-Consortium (MIICO)** worked on market promotion and linkages, post-harvest management, buyer-seller forums at cluster level for contract negotiation, construction of warehouses and rehabilitation of storage facilities, business skills, crop aggregation and empowerment in Sumbawanga Region.
- **Building Rural Incomes Through Enterprise (BRiTEN)** was contracted to scale-up extension services, agro-dealership interventions, contract negotiations and crop aggregation, legalization of farmer organizations and the promotion of input distribution to business partners. The roles, skills, and responsibilities of IPs are listed in Appendix 4.1.

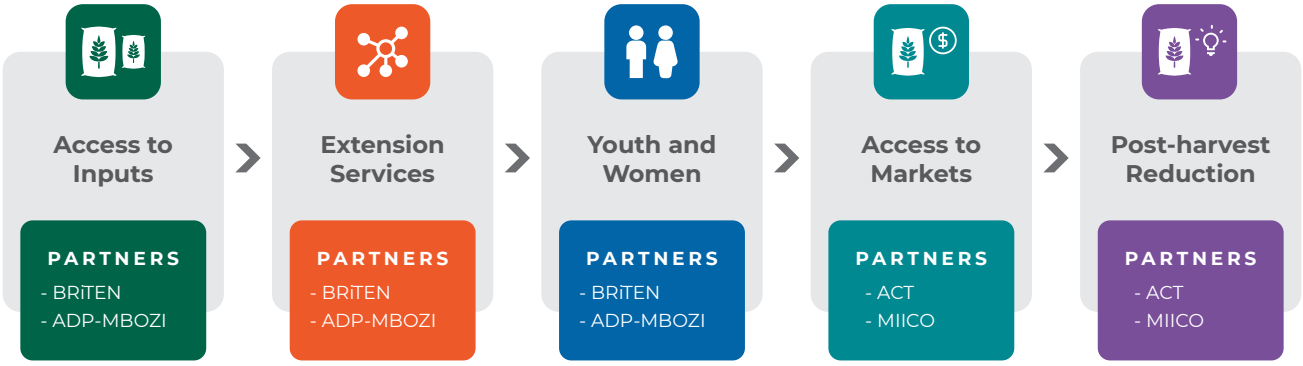


Figure 19: Focus areas of the implementing partners

Local government authorities were responsible for coordinating and guiding the flow of agricultural investment for effective and efficient service delivery to actors along the selected value chains, and the agriculture sector in general. The consortium established sub-national agricultural working groups in each region, on a platform comprised of stakeholders from public, private and non-profit organizations for public and private dialogues. The major purpose of the platforms was to discuss the challenges, achievements, and lessons learned for ongoing programs. Similarly, the platform provided an opportunity to improve investment coordination for better alignment and accountability.

Six districts in the SUKA Consortium benefited from AGRA's support to develop district agricultural development plans.

The resident AGRA Program Officer was responsible for coordinating the consortium partners to deliver as per the signed agreements. The officer was also in-charge of building collaborations with other players to create synergies between AGRA-funded programs and other agricultural initiatives in the targeted geographical area. Overall, the officer provided technical and managerial oversight to ensure the delivery of the consortium's objectives.

Summary of outcomes vs investments

The SUKA Consortium worked with private sector companies that made additional investments due to the business opportunities that emerged during the implementation. Key investments were made in new storage facilities, rehabilitation of warehouses and expanded access to credit for SMEs. A total of 136,748 smallholder farmers received skills training in extension, markets, access to finance, access to inputs and post-harvest management. As illustrated in Figure 20, the return on investment was 12 times by the end of 2020 – the consortium invested US$$2.1 million and created value worth US$$25.4 million through various investments.[7] These investments exploited opportunities along key trade routes to DRC, Rwanda, Burundi and Uganda.

The SUKA Consortium achieved milestones through systemic interventions that fostered forward and backward.

7 The value may be higher with the involvement of new mechanization hubs, suppliers and investment in value addition for maize, sunflower and rice businesses.

The achievements include:

a) Doubling inputs sales in Rukwa and Katavi regions from 23% to 40% for both local and international agricultural input companies between 2017 and 2020.

b) The downstream input retail outlets increased threefold from 78 in 2017 to 255 in 2020, reducing the average travel distance from 20 km to 9 km for input access and availability.

c) A 15% increase over the target in crops sold through structured trade (from 37,500 MT to 43,298 MT) with an estimated value of US$17.4 million, which benefited 25,340 farmers in 2020.

d) As the production levels increased, the SUKA Consortium helped local off-takers find market opportunities across the borders. This was done through B2B forums bringing together traders from Kenya, Uganda, Rwanda, and DRC.

e) Formalizing the businesses of 338 agro-dealers through Business Development Services and compliance with the regulatory requirements of TOSCI, Tanzania Pesticide Research Institute TPRI, and TFRA.

f) Growth and flourishing of cross-border trade by local and international companies, for example Africa Improved Food (AIF) from Rwanda, domestically outsourced more than 1,000 MT of maize with a large volume collected from Rukwa Region while Global Partnership Africa for Development (GPAD) from DRC Congo aggregated more than 100 MT.

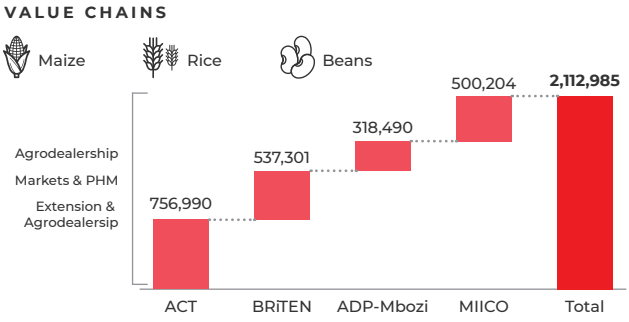
g) An average of 4 MT/ha yield, almost tripling the average of 1.5 MT/ha in the region (SUKA Consortium final report, 2020).

h) Increased number of SME agro-processors from 28 in 2017 to 90 in 2019 with provision for embedded services like storage, harvesting, hiring equipment, value addition (milling, grading, packing etc.), while offering employment and most beneficiaries being women.

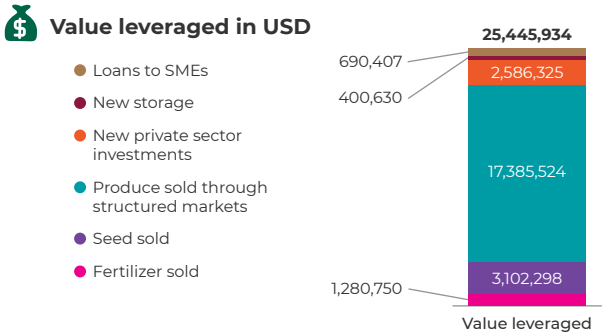
i) Local government investment in new metallic silo storage facilities with the capacity to store 22,500MT in each region of Katavi and Rukwa to aggregate surplus of cereals.

Value leveraged by the SUKA Consortium

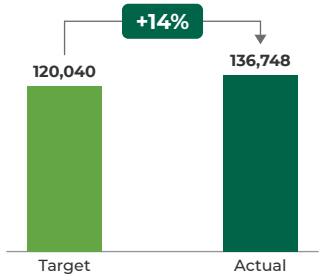
Implementing Partners and AGRA's Investments in USD



Value leveraged in USD



Number of farmers reached



- The value leveraged is **12 times** AGRA's Investments.
- Potential to increase value addition & regional trade: DRC, Uganda, Burundi and Rwanda.

Farmer-level impact

- Rice yield increased by 12% (from 5.6 MT to 6.3 MT/ha) to early adopter farmers.
- 47% increase in factory gate price due to improved quality of maize (a quality premium of TZS 450 to TZS 660 per kg i.e. from USD 205 to USD 300 per MT) for 2019.

Business impact

- 70% increase in private investment in storage facilities for processing and hiring service.
- The number of SME's engaged in value addition increased by 125% (from 28 in 2017 to 63 in 2019).
- Doubling of input sale for 23% to 40% for both local and international input companies.

Figure 20: Value leveraged by SUKA Consortium

Sustainability through BSC

The consortium approach connects all actors along the value chain, integrating small-scale farmers into agribusiness in a way that enables them to utilize capacity building as well as financial and other business development services. This approach is more comprehensive than many other value chain development interventions and hence, more successful (Weber and Ajambo, 2018). The SUKA consortium moved from a facilitated stage to business sub-consortia stage in 2018. By the end of 2020, the SUKA Consortium created three main business sub-consortia (BSC) that show evidence of sustainability: one in Katavi Region, and two in Rukwa Region, each working with an average of 21,507 smallholder farmers on input and output markets. There are two other promising BSC that have emerged, which are expected to increase the business competitiveness in sourcing cereal grain within the cluster. These BSC provide opportunities for building end-to-end linkages between smallholder farmers and markets, inputs supply, and embedded service provision.

Their main characteristics include:

a) Presence of key market players who form long-term partnerships to drive and catalyze systemic changes.

b) In-built core business values of trust, transparency, accountability and mutual business relationships for win-win trade deals.

c) Engagement in repeat business relationships leading to enhanced predictability in input and output markets. These BSC also strengthen synergy and reinforce long-term business relations in inclusive and profitable markets.

d) Established protocols for negotiating, agreeing, contracting and communicating are driven by private sector partners (pre- and post-production buyer seller forums).

e) Crowding-in key market actors, with each performing a specific role to enhance the market system.

f) Flexibility of value chain actors to alter sourcing arrangements depending on a conducive and suitable business environment.

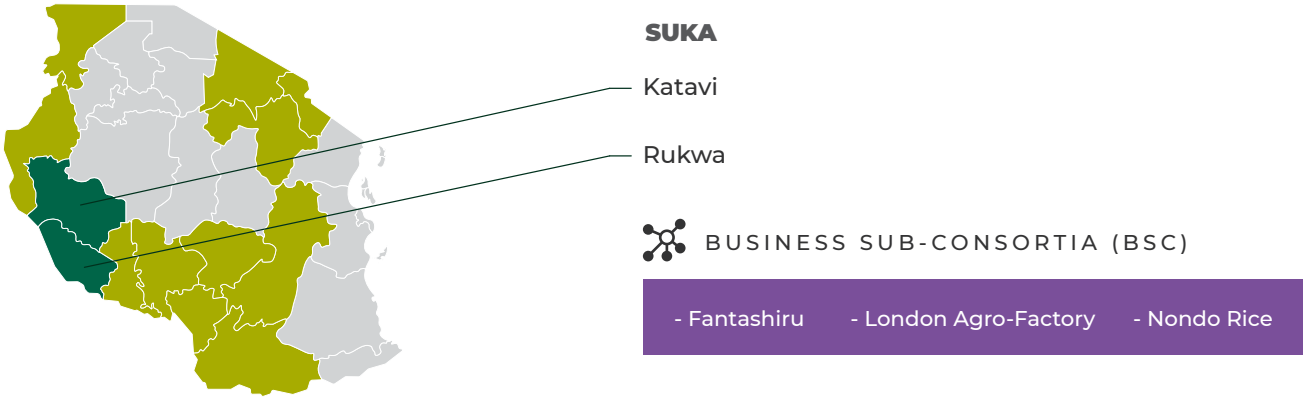


Figure 21: Business Sub-consortia (BSC) under the SUKA consortium

Fantashiru Business Sub-Consortium

This BSC was championed by Fantashiru Enterprises with off-taking capacity of 8,000 MT. The company worked with several off-takers and other processors, selling maize flour within the region as well as supplying to neighboring regions. The company envisions the expansion of its processing capacity from 20MT to 50MT per day through the installation of modern technology, in addition to expanding markets to include South Sudan, Burundi and DRC. Figure 21 shows the members and partners of the Fantashiru BSC.

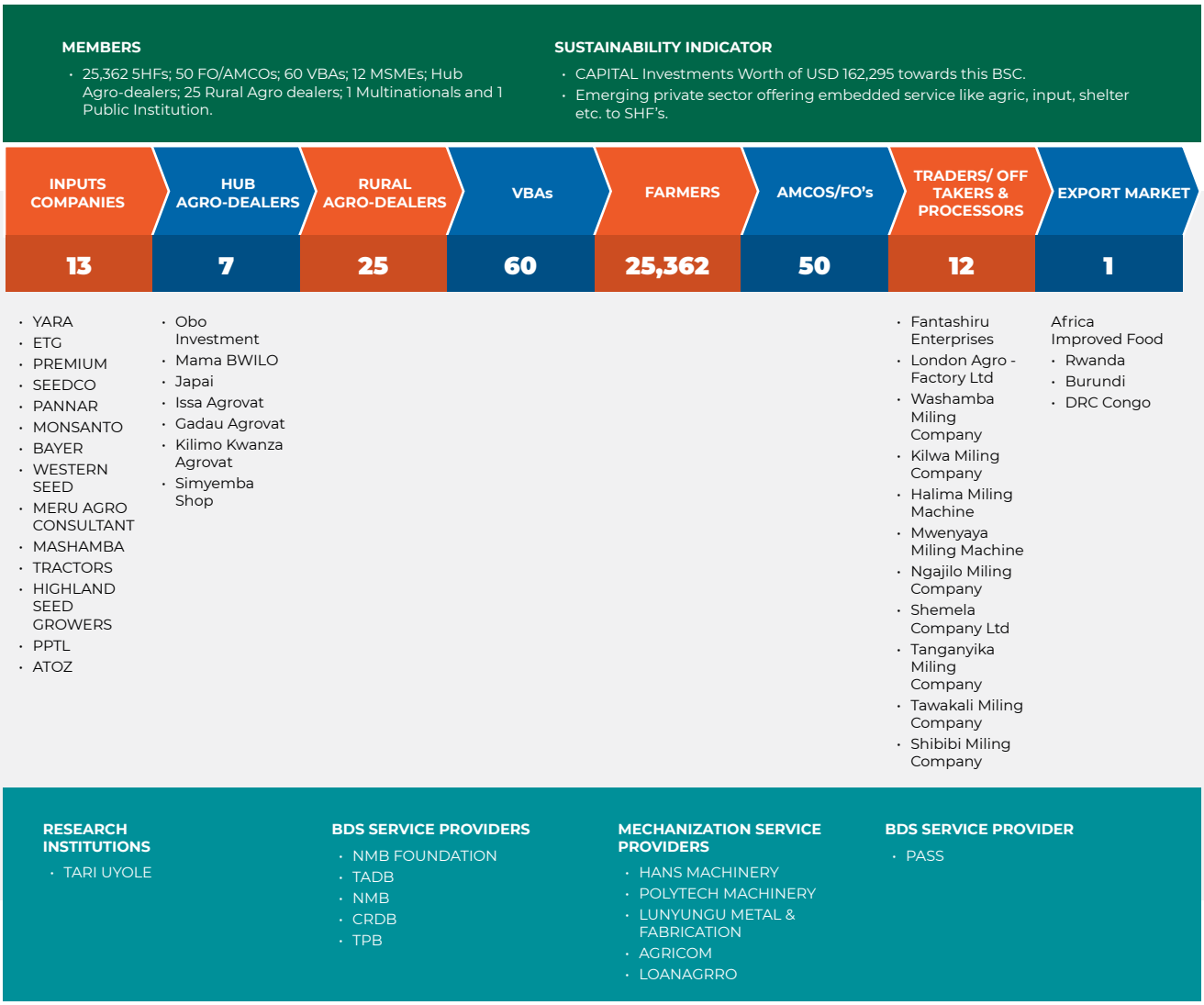


Figure 22: Members and partners of the Fantashiru Business Sub-Consortium

Input suppliers

a) Large suppliers such as Yara, OCP, ETG and Premium for fertilizers and SeedCo, Monsanto/Bayer, Syngenta, Pannar and Kibo for seed. These large seed companies have invested in the SUKA regions with long-lasting assets (such as warehouses) and permanent sales representatives.

b) Local inputs supply companies are also members of the BSC and they include: Meru Agro; Agriseed, Suba Agro; Namburi, IFFA, Mashamba Agro-Tractors; and Highland Seed Growers.

c) This BSC works with seven hub agro-dealers who have a network of 25 retail agro-dealers and 40 VBAs.

Hubs are the sole distributors and main outlets for many input companies. The assets and capital investment range from US$2,800 to US$120,000. The shop outlets mainly sell seed, fertilizer, crop protection products and other farming technologies. The stocking level and capacity depend on investment capital and supply networks. For example, the average tonnage for seed ranges from 20 MT to 400 MT. During the period under review, some players increased stocking levels, opened new sales outlets, and increased the number of farmer organizations served.

Box 2: Obo Investment supports consortium farmers with blended input finance

Obo Investment is a major distributor of Yara products and the hub agro-dealer in the Southern Highland region. The company worked closely with the Fantashiru BSC to support farmers with extension packages, particularly for the distribution of improved technologies – seed, fertilizer, training in good agronomic practices, development of demonstration plots and conducting farmer field days.

Access to credit is still a complex challenge for many smallholder farmers in many areas. Therefore, the consortium and Obo Investment developed a diversified input loan product to support farmers to improve crop productivity. The business model enabled farmer organizations and AMCOS to access input loans (seed and fertilizer) with an upfront payment of 50% value of input and the remaining sum repaid in cash after harvest with zero interest rate. Towards the end of 2020 the company supported almost 3,000 farmers through blended input finance, which ultimately increased household incomes and food security. The model was largely successful, but a cereals export ban imposed by the government distorted the output markets and lowered farm-gate prices on maize.

Mr. Olais Oleseenga, the CEO of Obo Investment, applauded the partnership with the consortium, noting that it accelerated work output and impacted the company positively. He said the business recorded a 10% annual growth, reached more farmers, increased customer demand and satisfaction for Obo products, and expanded to new regions in Mbeya, Songwe, Rukwa and Katavi.

Mechanization service providers

The establishment of new mechanization hubs by AgriCom and LonAgro companies expanded farmers' access to tractor hire services and regulated financial services. These companies also worked with lead farmers to increase availability and accessibility to these services along the value chain. Available services included: tractor hire services (combine harvesters, harrows, weeders, threshers, etc.), various loan products, and the sale of spare parts.

Post-harvest losses were among the major challenges for Katavi and Rukwa regions, the SUKA Consortium invested in capacity building skills for 110,671 smallholder farmers in post-harvest loss reduction, and construction of five new warehouses, each with 660 MT storage capacity. Similarly, the rehabilitation of 41 storage facilities created 48,759 cubic meters of storage space within both the public and private sectors. Table 9 summarizes technologies made available to farmers and SMEs.

Table 9: Quality enhancing technologies supported by SUKA Consortium

S/N	Item	Quantity
1	New warehouses	5
2	Storage facilities refurbished	41
3	Moisture meter	35
4	Tarpaulin	30
5	Maize sheller	28
6	Weighing scale	35

S/N	Item	Quantity
7	Pallets	600
8	Paddy sheller machine	1
9	Rice harvester	5
10	Rice planter	1

Box 3: Multi-crop threshers support grain loss reduction

Lunyungu Workshop and Fabrication is a youth-owned company in Rukwa Region. Its core business is the fabrication of small milling and crushing machines for grains. The company employs 15 male and female. Depending on customer needs and specifications, the machines are designed to be powered by petrol, diesel or electricity. The company was a member of the BSC providing mechanization services. Previously, the region used to be associated with high rates of pre- and post-harvest losses, poor grain quality, and high levels of debris. This made Rukwa maize less competitive in the market compared to maize from Zambia.

SUKA Consortium supported farmers and SMEs with different interventions including capacity building, infrastructure development, and rehabilitation and driving adoption of loss reduction technologies and practices. The company was one among four that were supported to attend a multi-crop thresher training in Kigali, Rwanda in 2019. Lunyungu was able to secure a lucrative market in Zambia for the supply of motorized threshers. Similarly, it created rural employment by offering hired thresher services through youth-led initiatives.

This has progressively improved the quality of maize grain with cross-boarder sourcing companies, such as Africa Improved Food (AIF) from Rwanda, entering Rukwa region. This was another important milestone for the BSC towards post-harvest loss reduction with the multiplier effects of creating jobs for local artisans and the creation of rural business opportunities. In 2019, the firm sold 46 threshers, earning a revenue of TZS55.2 million (~US$23,755). This grew signiifantly to 76 units and TZS91.2 million (~US$39,652) in revenue in 2021.

Extension service providers

Extension services are provided by government extension agents, agro-dealers, and VBAs who also double up as micro agro-dealers. The VBAs include men, women and youth, and they promote and create demand for inputs through demonstration plots. They also aggregate inputs demand and supply of outputs at a fee. More advanced VBAs have acquired farm equipment to provide mechanization services to smallholder farmers. They provide “last mile” distribution of inputs as well as “first mile” marketing of commodities, earning commissions from both.

Box 4: A story of transformation, from input demand aggregation to owning an agro shop

Mr. Eliya Masoya is a 43-year-old VBA and farmer from Msanzi Village, Kalambo District in Sumbawanga Region. The SUKA Consortium supported him to improve his skill set in good agricultural practice, business skills and post-harvest loss reduction. The consortium also supported market linkages with a hub agro-dealer (Mama Bwilo). Equipped with the skills and business connections, he started supporting and serving farmers in Katuka, Nachula and Kambiala villages by aggregating input demand and linking them to the hub agro-dealer. He earned commissions through these trade-offs, enabling him to save up to US$200 (TZS460,000) with which he started a micro agro-dealership selling seeds and pesticides to farmers. From the mutual business relationship with hub agro-dealers, he was able to increase his working capital and input sales to reach 1,016 farmers and supply 4.9 MT of seed, 6.9 MT of fertilizer and 23,200 liters of herbicide/insecticide in 2020. Eliya improved accessibility and availability of inputs by reducing the distance to inputs for farmers from 20 km to an average of 5 km. Towards the end of 2020, business grew to US$1,739 (TZS4,000,000), with expansion into post-harvest loss reduction services through the provision of a grain threshing service for hire. Eliya now serves almost 1,500 farmers and the surrounding villages with the extension package and other services.

Farmers

On the farmers' side, the BSC served about 25,000 smallholder farmers with a suite of services, which included good agricultural practice, extension, post-harvest loss reduction, access to finance and markets.

Off-takers

i) **Fantashiru Enterprises** invested in physical infrastructure, logistics and processing facilities in Sumbawanga region to catalyze the maize processing business. With a processing capacity of 25 MT per day, the enterprise has an annual demand of 5,000 MT of maize. The company serves more than 1,300 farmers with signed contracts while offering embedded services like hiring of maize threshers, often provided on credit (Box 5). This BSC included 10 off-takers and/or agro-processors.

ii) **Halima Agro-Factory** is a maize processor based in Rukwa region. Before joining the SUKA Consortium, this SME had an installed capacity of 9 MT/day. Working closely with consortium partners, the SME increased its capacity to 15 MT/day. The company works with several farmer organizations in the maize aggregation business. In 2019, Halima Agro-Factory signed supply contracts with five farmer organizations to supply 800 MT of white maize, while offering a better market price.

iii) Other off-takers included Mwayaya Milling Company, Ngajilo Milling Company, Shibibi Milling Company, Tawakali Milling Machine, Sultan Milling Company and Steven Manwa Company.

Box 5: Fantashiru Enterprises' testimonial

The firm's managing Director, Anwary M. Said, noted that the consortium had helped him to dramatically reduce post-harvest losses with improved access to high quality raw materials from farmers as well as expanded markets. This has made it viable for the business to invest in modern infrastructure and facilities for post-harvest handling and processing. The company is also a beneficiary of improved quality of raw materials emanating from the strengthened business and working relationships with farmer's organizations. Previously, the company lost

approximately US$6,000 to. *"We now enjoy working with local farmers and fetching farm produce directly from farmers' organizations who also guarantee high grain quality,"* Said was quoted saying in *Habari Leo* newspaper on July 8, 2020. https://www.habarileo.co.tz/habari/2020-08-075f2d435e60bb4.aspx#

In terms of sustainability, the main indicators are:

a) Increased private sector investment in storage facilities, processing industries, mechanization hire services, field staff, offices and logistics (e.g., vehicles).

b) Increased use of forward delivery contracts that farmers secured from Fantashiru Enterprises, Halima Agro-processing Factory, Mwayaya Milling Machines, London Agro-Factory, and other off-takers/processors.

c) Premium prices offered to maize farmers who meet the quality and quantity requirements set by off-takers. Buyers were willing to top-up by TZS50 for every kilogram purchased to incentivize farmers to improve the quality of maize and promote grading systems.

London Agro-Factory Business Sub-Consortium

This BSC is anchored on London Agro-Factory, a maize processor based in Sumbawanga, with a storage capacity of 15,000 MT/year. Before joining the consortium, the company had capacity to aggregate 4,000 MT. After working with the consortium the company increased its storage capacity to 15,000 MT/year with working capital that was sufficient to purchase 10,000 MT/year from smallholder farmers. By the end of 2020, AGRA worked with TADB to facilitate London Agro-Factory Limited to access a loan of US$156,448 to acquire a 500 MT maize grain storage silo, as well as a 30 MT maize flour milling machine and auto packing machines. The loan was part of AGRA's YieldWise program for post-harvest loss management that promotes the adoption of appropriate loss-reducing technologies to improve crop handling, storage and processing. These investments demonstrated the growth and expansion of London Agro-Factory as one of the results of consortia work and opportunities to capture cross-border trade with DRC for maize flour. Other off-takers/processors included John Nguvumali Milling Machine, Ascar Milling Company, Kulwa Milling Machine, Tanganyika Milling and Washamba Milling Company. These additional processors had average capacity ranging from 10 MT to 25 MT per day.

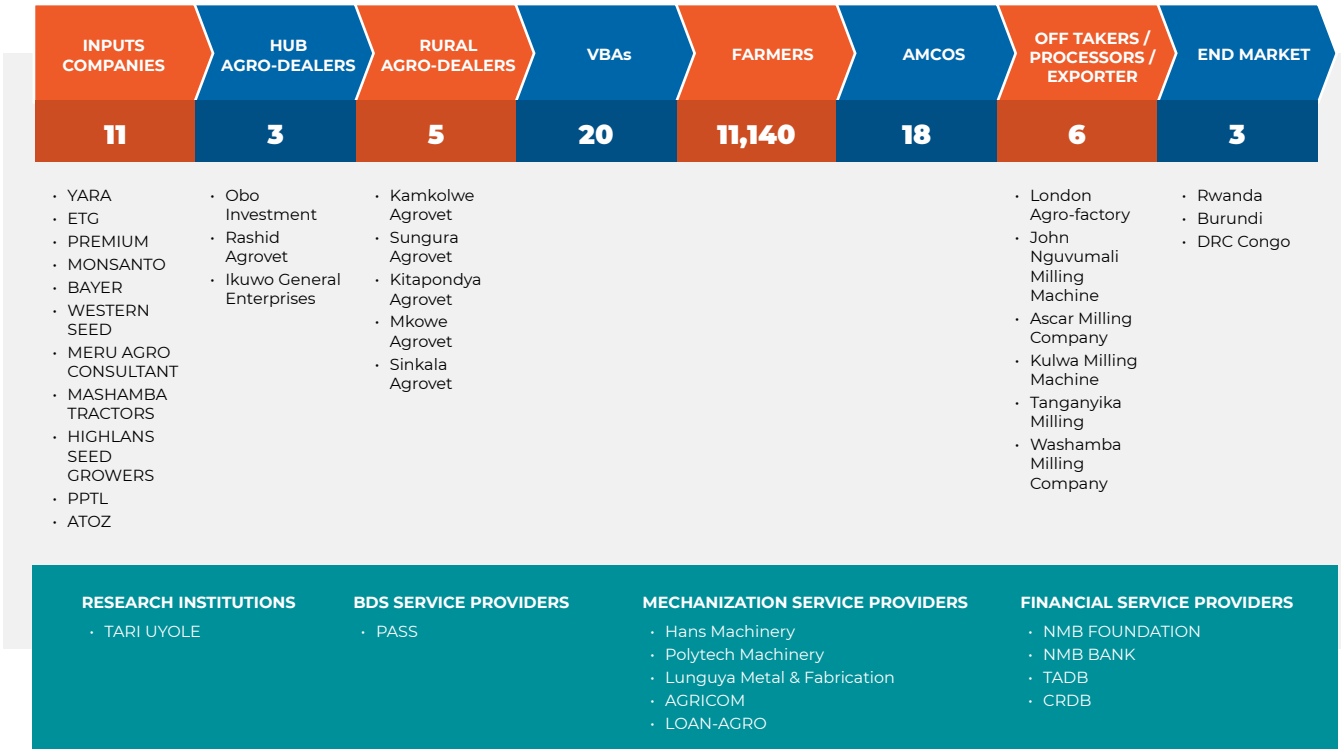


Figure 23: Members and partners of the London Agro-Factory Maize Sub-Business Consortium

Input suppliers

The BSC partners included:

a) Large suppliers of inputs such as:

   i) Yara, selling an estimated 2,000 MT/year of fertilizer to Rukwa and Katavi regions. The baseline data was difficult to gather from the companies due to confidentiality.

   ii) SeedCo, which supplies 650 MT/season of seeds to Rukwa and Katavi regions.

   iii) OCP Fertilizer Company, which supplies 5,000 MT/year of fertilizer in Rukwa and Katavi regions. The shift in supplied volume was driven by increased knowledge and awareness of farming technologies as a result of consortia work.

   iv) Other large input companies such as ETG, PANNAR, Kibo Seed, Agriseed, Zamseed, Suba, and Western Seed increased sales volumes due to an increase in awareness among farmers on improved technologies.

   v) Local inputs supply companies that were members of this BSC include Meru Agro, Highland Seed, Beula Seed Company, Lubango Seed Company, Namburi Seed Company and Mashamba Tractors for seed and herbicides. PPTL and A2Z mainly supplied hermetic bags.

b) Several hubs were members of this BSC. Most of them had established networks of rural agro-dealers, saving costs on agricultural inputs. Stocking levels increased for most hub agro-dealers, which translated into capital growth with an estimated average of US$50,000. Such dealrers included Obo Investment Company, Rashid Agrovet, Ikuwo General Enterprise and Matamba II General Enterprises. Capital expansion was one of the positive outcomes experienced by most of the hubs, allowing them to improve stocking levels from different suppliers of agro-inputs.

c) Retail agro-dealers were strong members of this BSC, contributing to distribution networks and causing a multiplier effect in the reach for smallholder farmers in rural areas. They supported the consortium through the sharing of technical know-how on the management of agricultural inputs, accreditation support and market linkages with potential suppliers, thus improving the business turnover for most rural agro-dealers. On average, most sold 100 MT of fertilizer and 20 MT of maize seed in a year, depending on seasonal fluctuations. Some of the members of this BSC were Kamkolwe Agrovet, Sungula Agrovet, Kitapondya Agrovet, Mkowe Agrovet and Sinkala Agrovet.

Farmers

London Agro-Factory BSC currently serves 18 AMCOS with a total membership of 11,140 smallholder farmers who are mostly involved in the maize value chain. A key catalyst of success was reverse extension whereby off-takers/processors sensitize farmers on quality specifications for maize grain before planting. This enabled farmers to produce maize varieties and grain quality that met market requirements.

Off-takers

- For the export market, the BSC developed a partnership with Africa Improved Foods (AIF) from Rwanda, which has an annual demand of 10,000 MT of maize. In 2019, the company procured more than 1,000 MT of maize from Tanzania, with a large volume collected from SUKA Consortium. Similarly, companies like GPAD also exported a significant volume maize grain and flour to DRC from SUKA Consortium. The companies worked with off-takers, logistics companies and local anchor buyers to aggregate quality maize grain for export markets.

Early indications of sustainability for this BSC include:

- Increased private sector investment in new storage facilities, processing industries, mechanization hire services, field staff, offices and logistics.
- Increased use and compliance with forward delivery contracts that farmers secured from off-takers and processors.
- A premium price model that increases the pay farmers receive based on quality and quantity of aggregated maize. Buyers were willing to top-up with TZS50 for every kilogram to incentivized farmers to improve maize grain quality and promote grading systems.

- Increased density of input selling points, reducing the distance travelled from 20 km to less than 10 km.

Box 6: London Agro-Factory's testimony on doubling annual profits

Mr. Asayile Paulo Msaku, the owner, said that the partnership with the project had transformed his investment with technical know-how as well as establishing long-term partnerships with smallholder farmers. "Before the PiATA-TIJA SUKA Consortium, my company was not registered, and operated under poor hygiene conditions," explained Mr Msaku. "We were procuring maize from middlemen at very high prices." The project accelerated inclusive business transactions that benefitted smallholder farmers. After establishing business relationships with 10 AMCOs the company bought 10,000 MT of high-quality maize. "My annual profits doubled from TZS20 million to TZS50 million. This has enabled me to expand my business operations including building a new warehouse, and I am planning to invest in 100 MT/day processing capacity and expand market coverage to DRC and Burundi" said Mr Msaku.

Nondo Rice Business Sub-Consortium

This BSC is anchored on Nondo Investor Company, a thriving multi-processor of maize, paddy and sunflower in Katavi Region. It worked with 20 other agro-processors that provided famers with output markets (Figure 24). The installed processing capacity for rice is 20 MT/day. At the time, Nondo had capacity to buy about 10,000 MT/year of paddy. The company registered more than 7,000 farmers and trained 1,200 smallholder farmers using its own extension staff. The business and its financial capacity has grown, with the company raising its annual revenue from US$295,750 in 2016 to US$458,741 in 2019.

The provision of storage services, markets and promotion of threshing machines helped to reduce post-harvest losses for smallholder farmers. Nondo supported 16 farmer organizations to access loans equivalent to US$389,800 from NMB through a warehouse receipt system and contract farming. This BSC also benefited from AGRA supported initiatives geared towards the promotion of competitiveness in the rice industry in East Africa.[8]

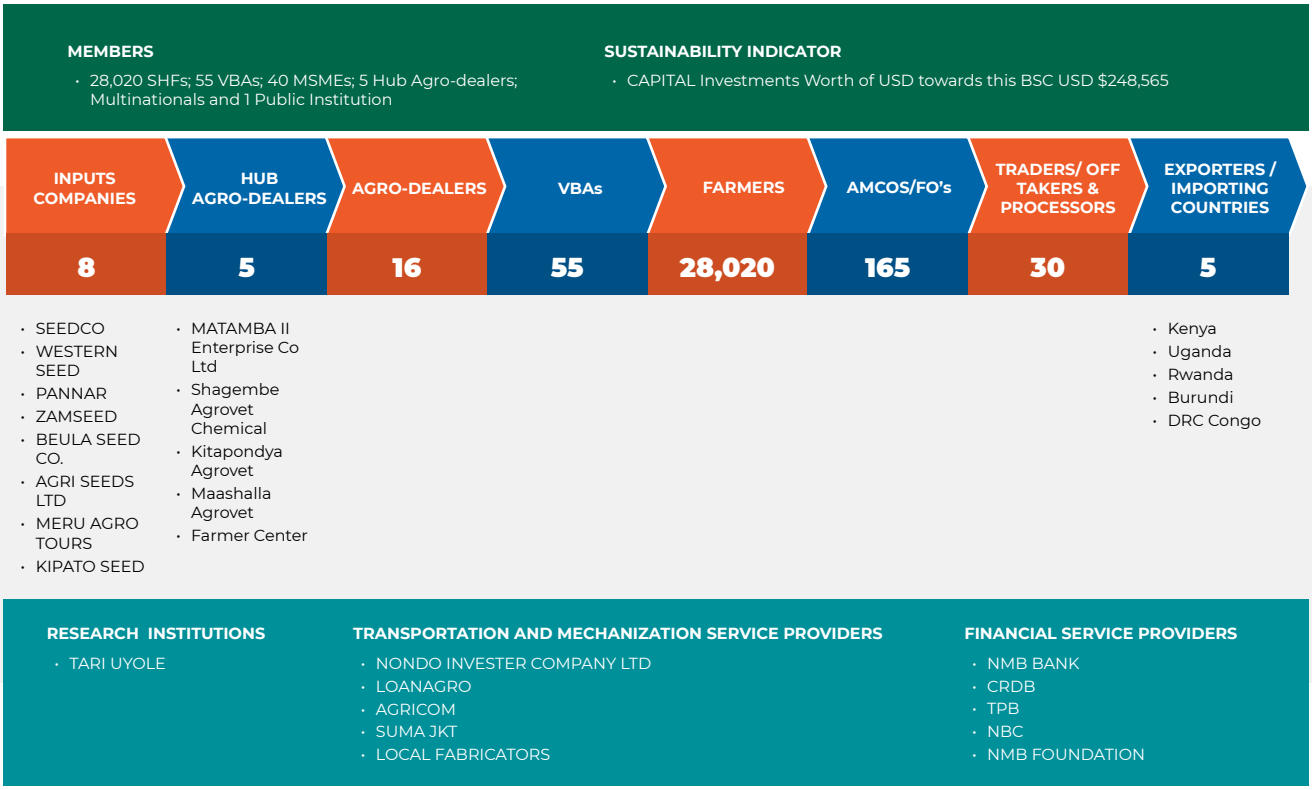


Figure 24: Members and partners of Nondo Rice Business Sub-Consortium

8 Competitive African Rice Initiative in East Africa Project (CARI-EA) is a 3-year initiative implemented in Tanzania, Kenya and Uganda.

Input suppliers

Large suppliers of inputs included Yara and ETG. Suppliers of seed serving the Nondo Rice-BSC included SeedCo, Pannar, Western Seed and Zamseed, combining to supply of up to 1,480 MT of seed per year.

Several local companies were also members of the BSC, including Suba Agro, Meru Agro, Kipato Seed, Agriseed, Mashamba Tractors, Highland Seed, Namburi Seed and Kibo Seed. The market share for local seed companies in this BSC averageed 450 MT/year representing 23% of the total seed market. The volume sold and distribution coverage depended on prices, quality, yield, drought tolerance, farmers' preferences, availability and other market parameters.

This BSC also worked with six hub agro-dealers as members: Matamba II Enterprise, Shagembe Agro-vet, Chemical, Kitapondya Agro-vet, Maashalla Agro-vet, and Farmer Centre Investment. The average annual sales turnover ranged between US$40,000 and US$245,675. Similarly, 16 retail agro-dealers were strong members of this BSC, extending the supply of agricultural inputs to rural areas.

Extension service providers

Extension and farmer advisory services were provided by government agents, retail agro-dealers and VBAs. A total of 55 VBAs were engaged in input and output markets, aggregating the demand for inputs and supply of output at a fee. This BSC also hired six extension agents to support farmers with technical know-how on crop production and commodity handling.

Farmers

This BSC served 28,020 farmers (men, women, and youth) in Katavi Region. These farmers were predominantly those who produce an average of 3.6 MT/hectare of rice.

Off-takers

There were 20 off-takers/processors in this BSC who bought from farmers in the targeted geography. The main cereal millers included Bunzali (5,000 MT/year), Nzella (5,000 MT/year), Msona (3,500 MT/year), and Msuka (2,500 MT/year). These off-takers established access to export markets for rice in Rwanda, Burundi, DRC, Kenya and Uganda. The engagement with the consortium accelerated business growth with upgraded off-taking and processing capacity.

The early **indicators of sustainability** for this BSC include:

a) Input companies offering sales volume incentives and long-term supply contracts with credit periods of up to six months to hub agro-dealers to catalyze distribution channels of inputs to rural areas.

b) Local government investment in a new modern storage silo with the capacity to store 22,500 MT of surplus grain in Katavi Region.

c) Increased private sector investments in extension services. For example, Nondo Investment Company has established its own extension service with six staff members.

d) Increased willingness among famers to pay for private warehouse services.

e) Innovative financial products such as the NMB warehouse receipt system providing credit with stored paddy as collateral.

f) The six rehabilitated warehouses are in the process of being certified by Tanzania Mercantile Exchange (TMX) for ease of access to markets and finance.

g) Increased access to lease financing facilities: established mechanization hubs with AgriCom and LonAgro companies supplying modern agricultural implements, spare parts, and different loan products.

Weaknesses and Opportunities for Improvement

- Access to finance for smallholder farmers remained largely challenging due to high interest, complex loan procedures and fear of asset risk. Though cooperatives were established to provide credit, they remain rather weak to give the required financial services to their members. This is also associated with poor governance of cooperatives, high default rates, corruption and embezzlement. To increase smallholder farmer access to finance, there is need to explore opportunities to expand value chain finance, consider risk-based loan pricing for crops and products, shared credit screening, enhanced cooperative governance, and improving communication between government and other value chain actors.
- Export ban for grains and related administrative challenges: In the recent past, the government-imposed export bans on grains to neighboring countries to ensure food security for the country. Generally, Rukwa and Katavi regions have proximity advantage to trade with DRC compared to transporting grains 1,200km to Dar es Salaam. Even when the ban was lifted, bureaucracies in securing export permits negatively affected grain trade in the region. Such ad hoc practices disrupted and lowered the price of maize and disincentivized farmers to produce marketable surplus. Moving forward, the government needs to continue using a food balance sheet and other related data to monitor food security indicators in the country and trends in the region.
- Poor processing technology: Most SMEs engaged in maize and rice value addition are using old technologies that result in poor quality products that cannot compete with imports or fetch premium prices. Furthermore, most of these factories operate below 50% installed capacity. Among bottlenecks facing processors include poor equipment maintenance, inadequate capital, unfavourable loan terms, and limited skills. This calls for future investments from catalytic funds and venture capitalists to address existing gaps and enhance millers' capacity to optimize food processing operations in the region.
- Unstable and fluctuating market prices: Unpredictable demand and supply are greatly affecting farmers, dampening their efforts to improve production. Usually, farmers believe that prices will remain as they were in the previous season or increase in the new season, which is not always the case. To solve this, government and private sector operators must put in place price discovery mechanisms that enable farmers to make informed decisions on types of crops to grow and production levels.

Conclusion

The SUKA Consortium interventions were implemented in an area where the Tanzania government and the Millennium Challenge Corporation (MCC) invested in road networks, electricity lines, and a port. Agribusinesses that participated in this consortium leveraged on these investments to increase the level of grain trade and processing. Due to investments made by the consortium to improve the quality of produce, participating farmers were able to integrate regional markets and supply food processors in the neighboring countries of Uganda, Rwanda, Burundi and DRC. This intervention also contributed to developing a network of input suppliers working together with traders, processors, producers, as well as financial institutions. The consortium intervention also provided a platform for public and private sector dialogues to address the challenges affecting agribusinesses in the region, such as commodity levies.

Despite these achievements, the implementation of the consortium was faced with a number of constraints such as limited access to finance for various actors, policies that limited access to cross-border market opportunities, limited capacity and knowledge in food processing and commodity price fluctuations.

Acknowledgements

The authors acknowledge technical support provided by implementing partners such as ACT, ADP-MBOZI, BRITEN, and MIICO. The implementation of the SUKA Consortium would not have been successful without the coordination and supervision support provided by the Regional Secretariat of Rukwa and Katavi. We sincerely acknowledge the

role played by the private sector partners who include input companies, processors and off-takers, mechanization service providers and financial institutions, as well as participating farmers.

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Annex 4.1: SUKA Consortium Members and Responsibilities

Value chain component	Implementing partner and key skill sets	Contracted outcomes	Contracted outputs
Markets and trade	Agricultural Council of Tanzania (ACT) is the private sector apex. It unites all stakeholder farmer groups, associations, cooperatives, companies and institutions whose activities are related to agriculture, including farmers, researchers, traders, processors and transporters transporters	Strengthened and expanded access to output markets	• 10,000 smallholder farmers and 12 SMEs acquired skills and able to take up financial and risk management products • 30 farmer organizations and other market actors supported to access financing available from financial institutions for crop production and purchase of farm equipment • 12,500 MT of grain sold through structured markets and warehouse management • 20 farmer organizations supported to develop business plans in aggregation centres • Support local buyers and processors to access regional markets, with technical and policy/regulatory support
	MIICO is a membership organization formed by three organizations dedicated to designing and training farmers in agribusiness skills, facilitating negotiations among actors such as financial institutions, input suppliers and markets.	Increased capacity of smallholder farming households and agricultural systems to better prepare for and adapt to shocks and stresses	• 135 buyer-seller forums organized at cluster level for contract negotiation and signing forward contracts • 12,500 MT of grain sold through structured markets • Support 12 aggregator SMEs with equipment and storage renovations
	BRiTEN		• 12,500 MT sold collectively by smallholders
Primary handling and aggregation	ACT	Increased access to improved crop storage infrastructure Increased use of improved post-harvest technologies	• 30,000 smallholder farmers trained on good post-harvest handling practices, techniques, technologies, and warehouse management • 20 stores/warehouses refurbished with basic produce handling and quality management tools • Farmers in 20 buying centres supported with simple quality control tools and warehouse equipment • 2 warehouses constructed in strategic locations and ready for aggregation of farm produce
	MIICO	Increased awareness by smallholder farmers on improved post-harvest technologies and practices	• Training conducted for 40,000 new farmers in producer organizations on business skills, contract negotiation and crop aggregation

Value chain component	Implementing partner and key skill sets	Contracted outcomes	Contracted outputs
Building inputs supply system and extension	Building Rural Incomes Through Enterprise Limited (BRiTEN) is a non-profit organization dedicated to increasing incomes and improving livelihoods through interventions in Agriculture, Business and Environment.	Increased staple crop productivity for smallholder farmers	• 25,000 farmers trained and participating in project events/ field days/ demonstration • 150 government extension officers sensitized on climate smart resilient varieties • 4,375 farmers connected to ICT services for extension messages and aggregation of inputs • 51 agro-dealers operating efficiently-37 farmer organizations with legal status to access financial services • 3 seed varieties commercialized • 290 demonstration plots established on climate smart technologies
	Actions for Development Programmes — Mbozi (ADP-Mbozi) is a leader in facilitating socio-economic empowerment of marginalized rural and urban communities in the Southern Highlands of Tanzania through the promotion of improved agriculture production and food utilization, entrepreneurship and market development. It addresses the challenges of environment and climate change, community empowerment with regard to children's issues, gender, HIV and AIDS and good governance	Strengthened agricultural input systems, technology development and supply chain	• 20,000 new farmers in producer organizations are trained on business skills, contract negotiation and crop aggregation • 300 linkages between Hub agro-dealers, input companies and output buyers to establish and strengthen business linkages within the cluster • 150 FOs capacitated to adopt farm budget practices (record keeping; costing, and profitability in focused value chains • 300 demos established in partnership with input and technology suppliers • 8,750 smallholder farmers are using Innovative approaches facilitating inclusive access to inputs and extension services

5. Stimulating Demand for Improved Agricultural Technologies to Attract Private Sector Investment in Kagera Region

Mwakasaka I., Rweyendela V., Karuho O.

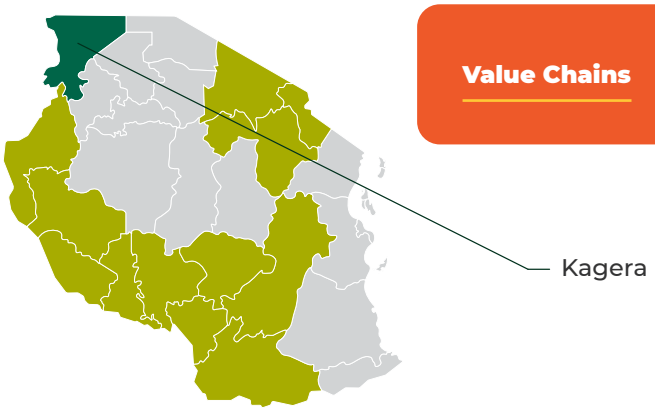
Key Messages

- Kagera Consortium helped to create demand for improved technology, thereby attracting investments in input production and marketing (improved seed, fertilizers, extension, post-harvest technologies).
- Through reverse extension, participating farmers adopted technologies and agronomic practices to meet formal market requirements (domestic food processing and export markets).
- Consortium interventions in Kagera Region strengthened the coordination and accountability of the local government towards the implementation of agricultural programs.

Key Words

technology adoption, reverse extension, coordination and accountability

Introduction



Value Chains Maize Cassava Beans

DISTRICTS

- *Biharamulo*
- *Bukoba Rural*
- *Bukoba Urban*
- *Karagwe*
- *Kyerwa*
- *Missenyi*
- *Muleba*
- *Ngara*

Figure 25: The Kagera Consortium area of operation

The Kagera Region is located to the north-western side of Tanzania, on the western shore of Lake Victoria. It is Tanzania's 15th largest administrative region and accounts for approximately 3.3% of Tanzania's total land area.

Administratively, the region has seven districts: Bukoba, Biharamulo, Muleba, Karagwe, Ngara, Kyerwa and Missenyi. It shares land borders with Uganda, Rwanda, and Burundi and a marine border with Kenya on Lake Victoria. It is also within easy reach of South Sudan and DRC. Considering that the region borders four member states of the East African Community (EAC), it is strategically located for potential cross-border trade (URT, 2019).

Table 10: Kagera region demographic summary

Total suitable land for agriculture	Percentage of land under cultivation	Actual population in 2012 population census	Percentage of population growth rate per annum	Population projection for year 2020	Population engaged in agriculture (crop production) by June 2019	Households engaged in agriculture (crop production) by June 2019
1,120,000	57.5	2,458,023	3.5	3,238,347	1,145,538	365,125

Source: URT (2020b) and NBS (2020)

Table 11: Kagera crop production 2016 - 2020

Crop	2016/2017		2017/2018		2018/2019		2019/2020	
	Ha	MT	Ha	MT	Ha	MT	Ha	MT
Paddy	6,378	14,670	11,240	26,323	10,568	11,074	14,385	27,052
Maize	120,804	109,440	154,066	243,287	155,568	241,380	150,641	224,634
Sorghum	11,734	12,577	11,354	7,395	11,466	18,221	638	5,488
Banana	168,200	1,420,445	186,417	2,379,901	209,576	2,445,547	189,247	2,218,318
Beans	108,939	60,114	121,644	115,442	172,816	154,191	155,593	99,952
Cassava	108,770	550,600	101,766	818,742	121,734	804,788	132,997	454,234
Sweet potato	47,500	151,595	66,943	196,860	62,785	202,322	54,044	233,414
Round potato	5,403	45,000	10,846	49,881	7,365	48,215	9,120	41,558.3
Yam	3,485	10,457	5,036	20,145	6,241	25,484	8,437	34,397
Groundnut	12,899	2,245	12,692	5,728	16,751	12,454	14,546	16,592.6
Total	**594,112**	**2,377,143**	**682,004**	**3,873,704**	**774,868**	**3,963,676**	**729,647**	**3,355,638**

Source: URT (2020a)

The Kagera Consortium targeted 255,000 smallholder farmers engaged in the beans, cassava and maize value chains. It covered the five districts of Karagwe, Kyerwa, Missenyi, Muleba and Ngara. By the end of 2020, the consortium had reached 302,262 farmers, representing nearly 30% of the farming population in crop production.

The consortium focused on developing productivity and market systems. From its design stage, the consortium closely collaborated with the few agricultural development initiatives in the region. These included:

a) Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA) project that was launched in February 2019 to work on the broad agenda of modernizing breeding and increasing the incomes of smallholder farmers in seven countries in Africa. The project is funded by the Bill and Melinda Gates Foundation and implemented by CIAT in collaboration with TARI Maruku. It was involved in the Kagera Consortium with the mandate to produce and maintain early generation seed.[9] AVISA will continue to create

9 https://www.avisaproject.org/about/

a robust system to enable the private sector seize opportunities in commercialization of dryland cereals and grain legumes.

b) The Food and Agriculture Organization (FAO) initiative (2017–2019) in response to the earthquake that occurred in the region in September 2016, supported smallholder farming communities to improve household food security and incomes. The support included capacity building and training for farmers and extension officers, and distribution of improved seeds, other planting materials, improved livestock breeds and agricultural equipment. It also had a major component on nutrition education. The regional and district capacities to prepare for and respond to disasters were also strengthened in order to enhance the resilience of smallholder farmers to shocks. The consortia project leveraged this initiative to improve extension services and inputs distribution systems.

c) Building an Economically Sustainable Seed System for Cassava in Tanzania (BEST Cassava), a 4-year Bill and Melinda Gates Foundation funded project (2017–2021) implemented by Mennonite Economic Development Associates (MEDA), the International Institute of Tropical Agriculture (IITA), TARI and TOSCI. The goal is to establish a commercial cassava seed system in Tanzania for smallholder farmers to ensure timely access to quality-assured, disease-resistant and higher yielding varieties at an affordable price. Participating farmers in the consortium accessed clean planting materials from this initiative.

Structure and roles of implementing partners

The Kagera Consortium focused on seed production, fertilizer supply chains, agro-dealership and extension as well as enhancing access to markets. Reverse extension was achieved by working with processors and traders, especially those exporting to the Uganda, Rwanda, Burundi, DRC and South Sudan markets. Appendix 5.2 provides a more detailed description of the implementing partners and their key roles.

a) TARI Maruku: An agricultural research institute with a multidisciplinary team of scientists and a track record for developing agricultural technologies. Its role in the consortium was to produce and maintain early generation seed (EGS) to meet market demand for varieties of beans and cassava.

b) Ruvuma Commercialization and Diversification of Agriculture (RUCODIA): A local NGO that offers extension services to farmers and farmer organizations with a focus on demonstrating new technologies. Its role in the consortium was to develop and strengthen agro-dealer networks that enhance the delivery of agricultural inputs and associated technologies to smallholder farmers.

c) Karagwe Development and Relief Services (KADERES): A local NGO based in Karagwe District whose core business is to organize farmers into viable groups and empower them through training on good agricultural practices, integrated soil fertility management and other extension services. KADERES was responsible for providing extension services to farmers participating in this consortium, with a major focus on the bean value chain.

d) Faida Market Link (Faida MaLi): A local NGO that provides business development services to SMEs and farmer organizations engaged in agricultural trade and food processing. Its role in the consortium was to improve access to markets for smallholder farmers and build the capacity of SMEs.

e) Farm Radio International (FRI): An international NGO whose role in the consortium was to lead interventions in extension through interactive radio programs and other ICT platforms to enhance the adoption of agricultural innovations.

The **Regional Secretariat** provided critical coordination support to ensure that the consortium and other agricultural transformation interventions in the region function effectively. The secretariat was involved in facilitating cross-border trade, and effectively implemented public-private partnership models to operationalize the district agricultural development plans. The Kagera Consortium signed a memorandum of understanding (MoU) with the secretariat to enhance the participation, supervision, and coordination of consortium activities. This partnership resulted in the following:

a) Improved coordination between consortium members through quarterly planning meetings and joint monitoring visits. The secretariat also evaluated the progress of agricultural interventions to ascertain evidence-based results and value for money.

b) Established sub-national agricultural stakeholder platforms to provide a space for public-private dialogues and support an enabling environment for agricultural marketing and trade development.

c) District authorities mainstreamed the consortium objectives in an open performance review and appraisal system for local government agricultural staff (extension officers).

The resident AGRA Program Officer was responsible for coordinating implementing partners and private sector actors in the region to upgrade agricultural value chains and expand market opportunities for smallholder farmers. The officer also collaborated with other agricultural development players to create synergies between AGRA-funded programs and other initiatives. Other responsibilities included:

- Identifying opportunities for collaboration with small, medium and large agribusinesses in Kagera Region.
- Providing technical assistance and backstopping to seed companies to ensure smallholder farmers in underserved areas were accessing high quality improved seed at affordable prices.
- Coordinating capacity building for grantees in data capture, management and reporting.
- Monitoring, evaluating and supervising grantee activities.

Summary of outcomes vs investment

The Kagera Consortium focused on attracting agribusinesses to invest in the critical segments of agriculture value chains, including seed production, fertilizer supply, and extension. The long-term goal was to enable farmers to increase production and tap into cross-border trade opportunities. With an investment of US$ 2.4 million, this consortium attracted US$51 million of private and public sector investment.

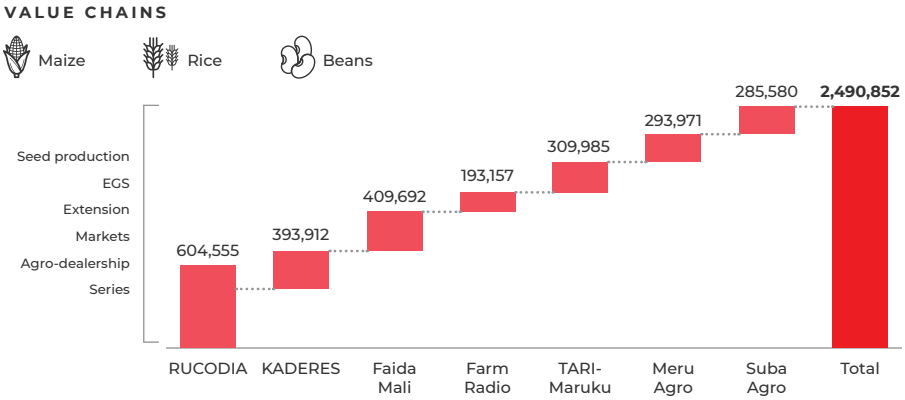
Figure 26 summarizes the leveraged investments as a result of the work and outcomes from the consortium. It is estimated (based on consortium results) that the value leveraged was 21 times the total budget allocated. This was leveraged through agricultural inputs sold by agro-dealers, the sale of beans and cassava, EGS, commercialization of the beans value chain, selling produce through structural markets and loans accessed by AMCOS.

The Kagera Consortium facilitated the production of seed and created linkages between private seed companies and TARI Maruku. The institute's production capacity for EGS increased from 1 MT of bean seed (prior to the consortium's intervention) to 16.5 MT in 2019, while cassava increased from 10 MT to 147.5 MT. Increased production of EGS provided entrepreneurship opportunities for youth involvement in the seed supply chain by enabling them to become certified seed producers. More opportunities were created for 544 rural-based retail agro-dealers in the last mile delivery of agricultural inputs. The network of these agro-dealers was leveraged by local seed companies to expand their rural distribution network.

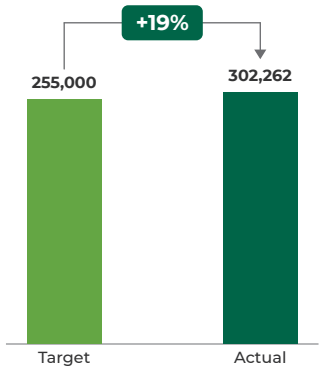
Strong partnerships with SMEs expanded smallholder farmers access to national and export markets, which in turn increased the farmers' willingness to pay for high quality inputs and services to increase their production. For example, maize production increased from an average of 0.9 MT/ha in 2017 to 3 MT/ha in 2020 (Kaderes, 2020). As a result of consortium interventions, the annual processing capacity of SMEs increased from 7,165 MT in 2017 to 16,265 MT in 2019.

Value leveraged by the Kagera Consortium

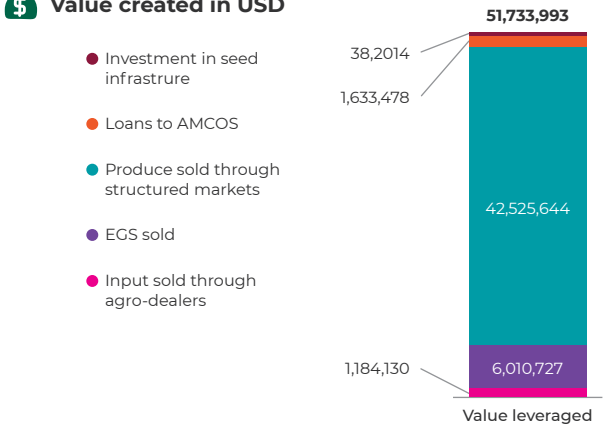
Implementing Partners and AGRA's Investments in USD



Number of farmers reached



Value created in USD



- The value leveraged is **12 times** AGRA's Investments.
- Commercialization of the bean value chain.

Farmer-level impact

- The quantity of produce sold through structured market increased from19,488MT in year 2018 to 40,723MT in year 2020 attract a total of US$ 41,888,000 worth of produce sold through structured market.

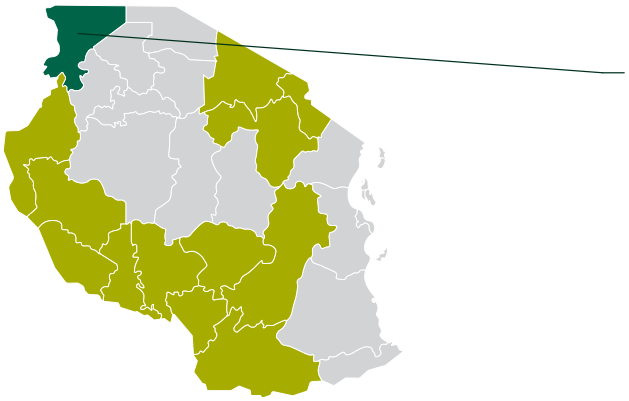
Business impact

- Increased beans export sales from US$ 239,130 in year 2017 to US$ 19,565,217 in year 2019.
- Increased volume of fertilizers sold in the region from 54MT of NPK (2016/17) to 362MT of NPK (2018/19).
- Increased of revenue of beans EGS producers from US$150,000 during project inception to $6,010,726.71.
- Increased of revenue of certified seed producers from US$ 65,217 during project inception to US$239,130.

Figure 26: Value leveraged by Kagera Consortium

Sustainability through Business Sub-Consortia

The Kagera Consortium started to evolve from an NGO facilitated model to a BSC model in 2018. Most BSCs were anchored on grain traders or agro-dealers. By the end of 2020, 17 BSCs whose members are predominantly local SMEs, had emerged. Three of these (Kaderes, Nyamiyaga, and Rugara) are fully operational, providing backward and forward integrated services to all the actors in the maize and beans value chains.



BUSINESS SUB-CONSORTIA (BSC)

- Kaderes - Rugara - Nyamiaga

Figure 27: Business Sub-consortia (BSC) under the Kagera Consortium

Kaderes Business Sub-Consortium

This BSC was anchored on Kaderes Peasants Development Plc (KPD), which is one of the largest off-taker of beans in Kagera Region. KPD purchases more than 20,000 MT of beans annually. The company has installed a warehouse with 16,000 MT capacity and is undertaking plans to invest in precooked and canned beans. AGRA supported KPD to access the European market for their beans. The support included trade finance, capacity development to meet EU market quality standards, and export logistics. In addition to export markets and improved capacity to meet stringent quality standards, KPD was able to secure a WFP supply contract. As a result of these, the company revenue grew from less than US$1 million in 2017 to US$4.4 million in 2020. The members of this BSC are illustrated in Figure 6 and described in summary therafter.

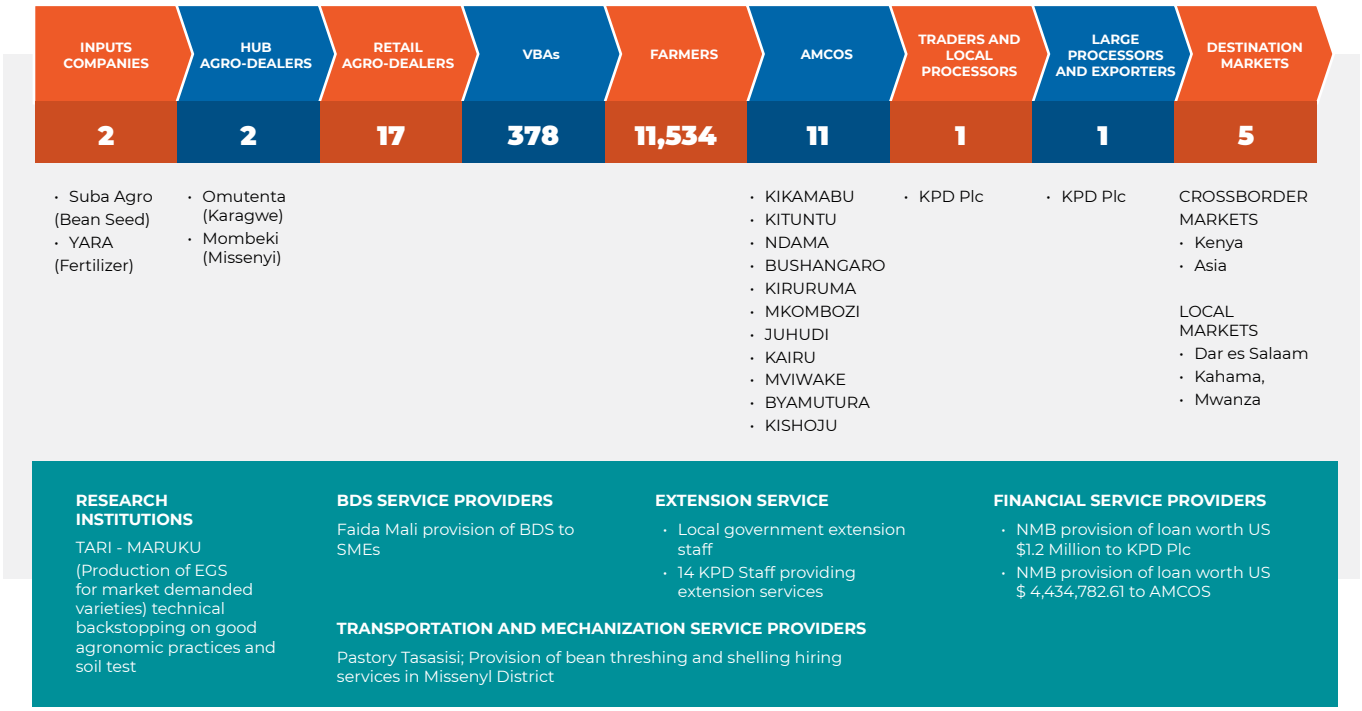


Figure 28: Members and partners of the Kaderes Bean Business Sub-Consortium

Farmers

This BSC serves 11 AMCOS with a total of 11,534 smallholder farmers who benefited from the upgraded bean value chain. One key driver of success was reverse extension, where KPD worked with TARI Maruku to establish a seed roadmap that addressed constraints preventing farmers from producing market demanded varieties (i.e., red kidney, red mottled and creamy mottled beans).

Extension services

Kaderes entered into an MoU with the local government to provide extension services to farmers participating in the bean supply chain. In addition, KPD hired a total of 14 employees who provided extension services in Kagera Region to ensure farmers produce quality market demanded bean varieties.

Input suppliers

The BSC's input suppliers are outlined in Table 12.

Table 12: Inputs companies' engagement in the Kagera Consortium

Company name	Category	Type of inputs	Existing/new businesses	Contribution/services provided
IFFA seed	Local	Seed	Existing	Participated in trainings and/or field days
Meru Agro	Local	Seed	New	Participated in trainings, field days and distribution of small packs for mother and baby demos
Suba Agro	Local	Seed	New	Participated in trainings, field days and distribution of small packs for mother and baby demos
Seed Co	Multinational	Seed	Existing	Participated in trainings and/or field days
Pannar	Multinational	Seed	Existing	None
Kibo seed	Multinational	Seed	New	None
Corteva	Multinational	Seed	New	Participated in trainings, field days and distribution of small packs for mother and baby demos
Bayer/DK	Multinational	Seed	New	Participated in trainings, field days and distribution of small packs for mother and baby demos
YARA	Multinational	Fertilizer	New	Participated in trainings, field days and distribution fertilizer for demonstration plots

This BSC worked with two hub agro-dealers and 17 retailers to increase access to inputs. The two hub agro-dealers are:

i) Richard Lutenta based in Karagwe District with a network of retail agro-dealers. Through his participation in the BSC, his business revenue grew from US$5,139.12 in 2016 to US$14,248.47 in 2020.

ii) Imran Mwombeki is based in Kyerwa District and as a result of his engagement, business revenue grew from US$1,870 in 2017 to US$12,174 in 2019.

Off-takers

For off-taking and marketing, KPD worked with other SMEs and AMCOS that were aggregating on its behalf. The main ones were:

i) Erasto Theodas: Annual sales grew from US$91,045 in 2017 to US$592,030 in 2020.

ii) Ponsian Ajunamungu: Annual sales grew from US$80,897 in 2017 to US$119,513 in 2020.

iii) Moris Venant: Annual sales grew from US$43,296 in 2017 to US$ 59,802 in 2020.

iv) Mchunguzi Deus: Annual sales grew from US$142,893 in 2017 to US$372,319 in 2020.

Figure 29: Kaderes beans consignment which met WFP standards

The BSC has shown the following signs of sustainability:

i) KPD is a lead firm with expanding domestic and export market opportunities. Due to opportunities in the end market, KPD is expanding its deal processing facility and enlisting more smallholder farmers. Furthermore, KPD has advanced investment towards the production of pre-cooked and canned beans, which will increase its market outlets.

ii) Farmers have increased knowledge and ability to supply high-quality beans to lucrative markets.

iii) Increased private sector investments in the different segments of the bean value chain such as seed production, processing, marketing for domestic, regional, and export markets.

Rugara Business Sub-Consortium

This BSC is anchored in the Rugara Traders Company Ltd, which is among the emerging food trading companies focused on beans. The company has a capacity to off-take more than 15,000 MT of beans annually. Out of this, 65% (9,750 MT) is exported to neighbouring countries (Rwanda, Uganda, Burundi and DRC) while the remaining 35% (5,250 MT) is sold in the Tanzania domestic market (Mwanza, Dodoma and Dar es Salaam regions). Before the consortium intervention (2016), Rugara was trading about 6,000 MT of beans annually. To increase bean production levels, AGRA-supported the consortium's investment in extension services, access to improved bean varieties, and linkages with producers. These interventions led to an increase in traded volumes to 15,000 MT annually in 2019.

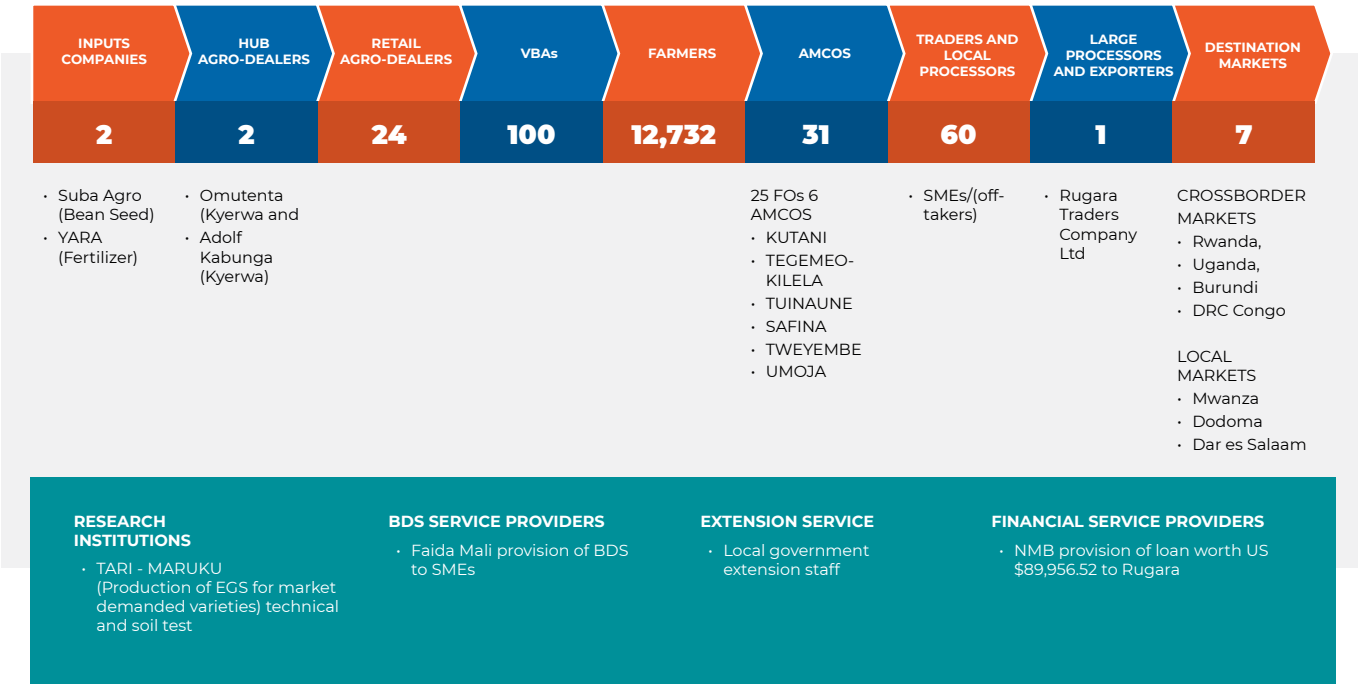


Figure 30: Members and partners of the Rugara Business Sub-Consortium

Input suppliers

On the input supply side, the partners to this BSC included:

a) Large suppliers of inputs such as Yara for fertilizer and Suba Agro for been seed.

b) The main agro-dealers partnering with this BSC include:

- Adolph Kabunga, whose sales revenue grew from US$1,304 in 2017 to US$7,291 in 2020, due to the expansion of businesses made possible by the partnerships built through the PiATA-TIJA Kagera Consortium.
- Richard Lutenta's business has grown from a revenue of US$521 in 2016 to US$8,348 in 2020.
- Restituta Beneth's business has grown from an accrued revenue of US$869 in 2017 to US$ 5,608 in 2020.
- Obeid Osward's business has grown from an annual revenue of US$253 in 2017 to US$3,474 in 2020.
- Joas Masoma's business has grown from a revenue of US$689 in 2017 to US$7,445 in 2020.

Extension services

This BSC worked with 100 VBAs and 24 small-scale agro-dealers, including:

- Remigius Modest whose business has grown from a revenue of US$708 in 2017 to US$6,152 in 2020.
- Jafari Matoke's whose business has grown from a revenue of US$780 in 2017 to US$9,681 in 2020.
- Rutakyamirwa Tibrurus whose business has grown from a revenue of US$2,744 in 2017 to US$6,890 in 2020.
- Antidius Byamanye's whose business has grown from a revenue of US$980 in 2017 to US$11,783 in 2020.
- Aniseth Edward's business has grown from a revenue of US$ 840 in 2017 to US$ 6,849 in 2020.
- Ashraf Mandera whose business has grown from a revenue of US$ 850 in 2017 to US$ 8,269 in 2020.

Farmers

The BSC benefited 12,732 smallholder farmers with integrated packages of services ranging from inputs, extension, to post-harvest handling and market access.

To make the chain more vibrant in terms of access to quality inputs at affordable prices, Rugara mobilized 24 last mile agro-dealers to supply items such as pesticides, which are the most required inputs in bean production. For example, Adolph Kabunga sold pesticides and hermetic bags worth US$7,150 in 2019/2020. Before participating in the consortium, his sales were US$2,250. This is one of the indicators that BSC might have sufficient incentives for business continuity.

Off-takers

Rugara worked with 15 SMEs under on the off-take aspect. These SMEs increased their sales as a result of collaborating with other market actors in the consortium.

In terms of sustainability, the following are early indications that this BSC is likely to continue serving smallholder farmers in the medium and long-term:

a) The lead firm in this BSC has an ongoing agreement with Rwabwere Local Government to use public storage facilities dating back to 2018.

b) The supply contracts involving the lead firm and public institutions (e.g. Tegemeo English Medium Primary School in Karagwe, Evangelical Lutheran Church of Tanzania, Karagwe Diocese and Kayanga Prison) is likely to sustain demand-led production of beans in the region.

c) The existing bean supply contracts between Rugara and two Ugandan exporters (TJ Growers and Link N Global Commodity) have also expanded market opportunities for farmers and provided incentives for improved quality and increased volumes of the produce.

Nyamiaga Business Sub-Consortium

This BSC is anchored on Nyamiaga Food and General Supplies Ltd, a processing company that produces maize and cassava flour branded "Nyamiaga Super Sembe". The company is based in Nyamiaga Village, Ngara District. A major market for Nyamiaga flour is exports to the neighbouring countries of Burundi and Rwanda. Another market is along the shores of Lake Victoria in Muleba District. Nyamiaga factory has an installed processing capacity of 2,500 MT annually, and plans to expand this to 10,000 MT. The company also plans to establish a modern cassava processing plant to serve more than 10,000 smallholder farmers in Ngara District. The maize value chain driven by this BSC benefited 700 smallholder farmers in Ngara District.

Nyamiaga factory has built business relationships with 32 agro-dealers who supplied agricultural inputs. This BSC increased volume of inputs purchased by farmers. For example, Joseph Meroma, an agro-dealer in Ngara, increased sales by 85.7% from US$2,450 in 2018 to US$4,550 in 2019.

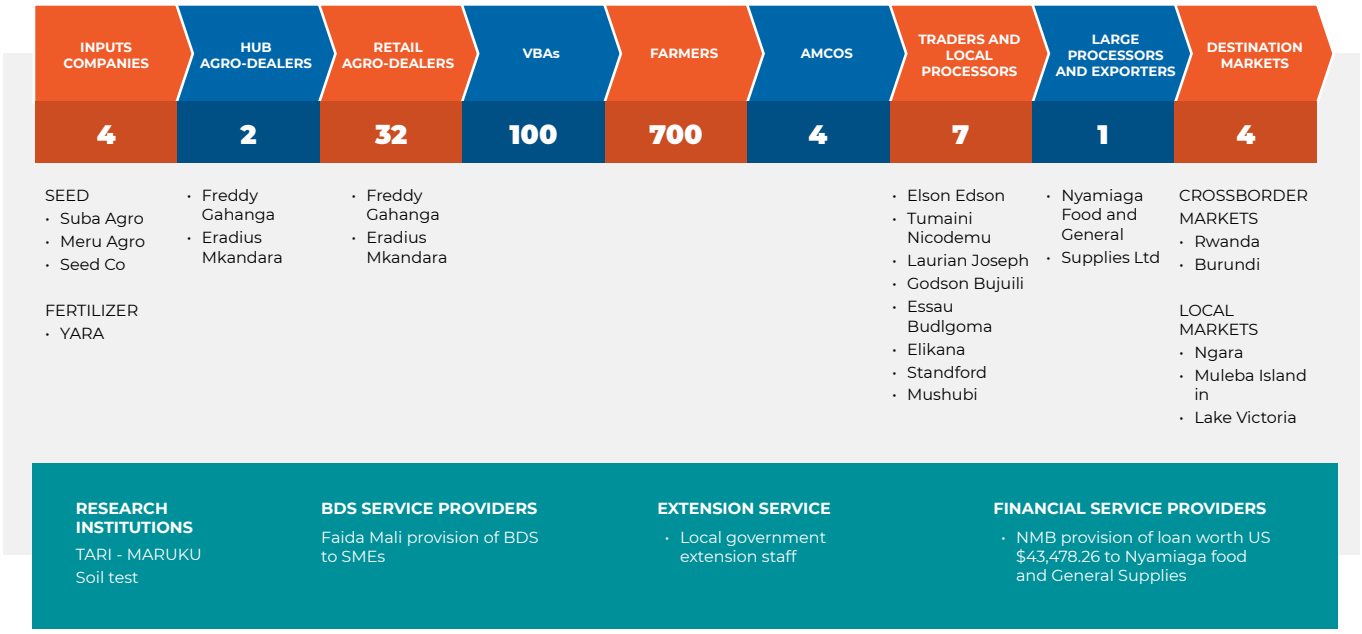


Figure 31: Members and partners of the Nyamiaga Business Sub-Consortium

Input suppliers

In the Kagera Consortium, the agro-dealers sold seed (45%), crop protection products (36%), and fertilizer (19%). They included:

- Duka la Kilimo na Mifugo (Gerald Sosthenes) – accrued revenue from the sale of agricultural inputs grew from US$995 in 2017 to US$9,491 in 2020.
- Duka la Kilimo na Mifugo (Hamad Seba) – revenue grew from US$450 in 2017 to US$4,370 in 2020.
- Juvenary Agrovet (Coltida Juvenary) – revenue grew from US$452 in 2017 to US$4,450 in 2020.
- Chisena Agrovet (Christian Chisena) – revenue grew from US$1,217 in 2017 to US$3,952 in 2020.
- Mukandara Agrovet (Eradius Mukandara) – revenue grew from US$1,059 in 2017 to US$6,565 in 2020.
- Paulo Agrovet (Paulo Edward) – revenue grew from US$396 in 2017 to US$4,230 in 2020.

Extension services

An innovative extension approach that takes into consideration various farmer needs, including access to information on available technologies, improved practices, and market opportunities was adopted in Kagera region. VBAs complemented by interactive radio messages were placed at the center of this approach. This was critical in supporting smallholder farmers to respond to market demand by growing preferred market crop varieties, and improving the quality and quantity of produce. This BSC worked with 100 VBAs to provide extension services to participating smallholder farmers. In addition, the BSC worked with 32 retail agro-dealers to deliver agricultural inputs and last-mile delivery services to farmers. Some of these agro-dealers included:

a) Sagida Ntemi (Duka la Kilimo na Mifugo): business has grown from a sales turnover of US$1,082 in 2017 to US$8,623 in 2020.

b) Chizanye Ruzika (Duka la Kilimo na Mifugo): business has grown from a sales turnover of US$882 in 2017 to US$7,608 in 2020.

c) Jaskim Kabebo (Jaskim Agrovet): business has grown from a sales turnover of US$842 accrued in 2017 to US$7,235 in 2020.

d) Justus Choya (Duka la Kilimo na Mifugo): business has grown from a sales turnover ofUS$653 accrued in 2017 to US$6,883 in 2020.

e) Jovitha Mugisha (Duka la Kilimo na Mifugo): business has grown from a sales turnover of US$1,367 accrued in 2017 to US$5,530 in 2020.

f) Azory Tirumanya (TIRU Agrovet): business has grown from a sales turnover of US$394 accrued in 2017 to US$4,834 in 2020.

Farmers

The BSC served about 700 smallholder farmers in the target districts with an integrated package of services ranging from inputs, extension, post-harvest handling and market access.

Off-takers

Off-takers provided an important pull-factor to ensure that farmers supported by this BSC had access to reliable markets. Members who participated in off-taking and marketing were:

a) Barongo Rusinda invested in assets worth US$289,710 US$ and had a turnover of US$434,565.

b) Pascal Solezi invested in assets worth US$198,360 and had a turnover of US$297,540 per year.

c) Taredi Marco invested in assets worth US$365,400 and had a turnover of US$548,100 per year.

d) Erick Patrick invested in assets worth US$247,600 and had a turnover of US$291,300 per year.

e) Theonest Bugongoro invested in assets worth US$4,250 and had a turnover of US$5,000 per year.

f) Hellena Adriani invested in assets worth US$39,150 and had a turnover of US$52,200 per year.

g) Nehemia Mjeberi invested in assets worth US$50,900 and had a turnover of US$65,200 per year.

h) Ludovick Senzige invested in assets worth US$66,000 and had a turnover of US$80,500 per year.

i) Muganyizi January invested in assets worth US$286,900 and had a turnover of US$326,000 per year.

Box 7: Felister Wallace, Kagera

Felister Wallace from Nyakayanje village in Karagwe District, is one of the project beneficiaries and a VBA. Felister was among the numerous farmers in Karagwe that used recycled seed and poor farming practices. At the start of the project, she was recruited and trained as VBA.

Weaknesses and Opportunities for Improvement

Weaknesses

- Despite ideal agro-ecological conditions for crop production, large tracts of land and market opportunities in neighbouring countries, the existing potential in Kagera Region remains underexploited. This is attributed to low crop yields resulting in limited marketable surplus.
- Trade infrastructure remains undeveloped, affecting opportunities to attract large investments in the agricultural sector. For instance, due to high electricity tariffs, grains produced in this region are processed in Uganda and the final product returned to the Tanzania market.
- The lack of reliable and high-quality aggregation and trading services results in farmers' vulnerability to price fluctuations.
- Despite investments made through the consortia and other initiatives in the region, input distribution systems remain fragmented, leading to high costs.

Areas of improvement

- Building the capacity of smallholder farmers to produce what the market demands and tapping into diverse business opportunities along the agriculture value chains.
- Enhancing SMEs' capacity in areas of aggregation, processing, and trading to increase farmers' access to domestic and export markets. This would also require an appropriate enabling policy environment for increased investments.
- Strengthening input distribution systems through business relationships (e.g. credit consignment) between agro-dealers and large distributors to hub agro-dealers.

Conclusion

The implementation of the consortium approach in Kagera Region unlocked private sector investment in agricultural systems such as inputs, post-harvest handling and marketing. As shown in this chapter, the reverse extension led to the commercialization of the bean value chain, while the cassava and maize value chains were improved by strengthening input production and distribution systems that connect input companies to rural agro-dealers and VBAs as last-mile delivery points.

The intervention further supported capacity development for the local government authorities to coordinate and implement agriculture programs. Considering the existing production and market potential, Kagera region still

requires support to further develop critical value chains, such as pulses, and to take advantage of the wider domestic and regional markets.

Acknowledgements

The preparation of this chapter benefitted from the support and input of the local government authorities, organizations, inputs companies, SMEs and smallholder farmers. The authors gratefully appreciate their contributions. In particular, we would like to thank the smallholder farmers and SMEs from Karagwe, Kyerwa, Missenyi, Muleba and Ngara districts that were engaged through the selected value chains and committed in the inputs and output markets. The authors further acknowledge the work carried out by implementing partners, namely KADERES, FAIDAMALI, FRI, RUCODIA and TARI Maruku. The Kagera Consortium interventions benefitted immensely from the coordination and supervision provided by Kagera Region Secretariat and local government authorities in the target districts, without whose support the interventions would not have been successful.

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Annex 5.1: Ongoing Projects in Kagera Region

Development partner	Name of partner's project	Value chain	Aspect being addressed	Organization implementing the project
FAO	FAO	Climate resilient crops	Increasing resilience for the most vulnerable people and communities	FAO, LGAs, MAVUNO, TARI Maruku
Bill & Melinda Gates Foundation	CIAT — Accelerating Varietal Improvement and Seed Systems in Africa (AVISA) project	Beans	Support breeding and seed delivery of dryland cereals and grain legumes	CIAT and TARI Maruku
Bill & Melinda Gates Foundation	MEDA — BEST Cassava	Cassava	Establish affordable commercial cassava seed system	MEDA, IITA, TARI Maruku
Bill $ Melinda Gates Foundation	Improvement of banana for smallholderfarmers in the Great Lakes Region	Banana	Alleviate the problem of Vitamin A deficiencies in the Great Lake Countries through banana-based foods	TARI Maruku
WV Switzerland, USA & Germany	World Vision	Beans, cassava & maize	Food security & economic development	World Vision

Annex 5.2: Kagera Consortium Members and Responsibilities

Value chain component	Implementing partners and key skill sets	Contracted outcomes	Contracted outputs
Markets and trade	Faida Marketing Company Limited (FaidaMali) has experience in: • community mobilization and sensitization for business opportunities • organizing farmers into groups and apex organizations • building farmers' capacity in different aspects such as organization, entrepreneurship, technical, farming as a business, farm planning, linkage to financial services, linkage to input and output markets	• Increased access to improved crop storage infrastructure • Increased use of improved post-harvest technologies and practices by smallholder farmers • Increased use of structured markets	• 7 warehouses repaired and equipped with basic produce handling tools, and operational to meet buyer quantity and quality requirements • 2 post-harvest technologies demonstrated • 180,000 farming households using post-harvest technologies/facilities • 200 farmer organizations trained in contract negotiations skills, aggregation models, post-harvest handling practices, techniques and technologies • 100,000 MT of produce aggregated for collective marketing • 90,000 farmers selling produce through structured trading facilities/arrangements supported

Value chain component	Implementing partners and key skill sets	Contracted outcomes	Contracted outputs
Modernizing smallholder farmers	Karagwe Development and Relief Services (KADERES) has been supporting subsistence farmers and smallholder farmers in Kagera to shift from peasantry and subsistence agriculture to agribusiness. Its core competence is organizing farmers into viable groups and empowering them	• Increased smallholder farmers adoption of improved production technologies and management practices at farm level	• 2,400 VBAs trained in good agronomic practices, market linkages, post-harvest technologies and service delivery techniques • 470 farmer organizations' capacities built in good agronomic practices and structured markets • 250,000 farmers receive AGRA supported short-term agriculture sector training • 2,400 demo plots established • 55,000 small packs distributed • 35 farmers learning and sharing experience events organized and conducted • 100,000 farmers participate in extension events • 100,000 extension materials distributed
Building inputs supply system	Ruvuma Commercialization and Diversification of Agriculture (RUCODIA) has experience in offering extension services to farmers and farmer organizations with a focus on demonstrating new technologies. It also has experience in developing and strengthening agro-dealer networks for last mile delivery of agricultural inputs and associated technologies	• Improved business management practices • Increased access to improved inputs by smallholder farmers	• 500 agro-dealers trained in BMT • 50 hub agro-dealers trained in advanced BMT, accreditation process and business development • 500 agro-dealers' capacities built in handling and safe use of fertilizers, seeds and agro-chemicals • 6 agro-dealer's accreditation events supported • 50 hub agro-dealers and input companies have established business-to-business relationships • 1,500 MT of fertilizer sold • 400 MT of improved seed sold • 430 new people employed by SMEs receiving AGRA support along the focus value chains • 220 women-owned enterprises along the focus value chains supported • 28 training events conducted to build capacity of farmers and other value chain actors along focus value chains • 550 individuals receive AGRA-supported short-term agricultural sector training

Value chain component	Implementing partners and key skill sets	Contracted outcomes	Contracted outputs
Technology development and dissemination	Tanzania Agricultural Research Institute (TARI)-Maruku is an agricultural research institute with a multidisciplinary team of scientists with a track record of developing agricultural technologies and innovations	• Increased accessibility to high quality improved seed varieties by smallholder farmers in the project area	• 18 MT of improved bean breeder/basic seed produced • 164 MT of cassava basic seed produced • 460 MT of cassava certified seed produced • 10 MT of high-quality bean basic seeds availed to seed companies for mass production of certified seed. • 367 MT of high-quality cassava seeds sold to farmers in the project target area • 100 value chain actors trained on cassava production, processing, and marketing techniques • 68,000 cassava cuttings distributed for the establishment of demos (in Kagera and Kigoma regions
Cross-cutting services — BDS, finance, policy, ICT and knowledge management	Farm Radio International (FRI) has vast experience in developing and rolling out digital technologies in communication for development, extension and scaling up initiatives. It integrates radio and mobile phones as the key ICTs for engaging with small-scale farmers, providing them with the information they need, and the space to discuss it and make informed choices that catalyze adoption of agricultural technologies and innovations	Increased farmers' awareness on improved seed and associated technologies	• 212 interactive radio programmes conducted to share information on the best-improved seeds, good agronomic practices and structured markets • 156 training events held to build capacity of farmers and other value chain actors along focus value chains • 230 other value chain actors participating in AGRA-supported extension services • 1,550 individuals receive AGRA supported short-term agricultural sector training • 20,000 farmers participate in interactive radio programmes • 302 extension materials distributed

Annex 5.3: Other emerging BSCs that offer market opportunities for consortia in Kagera Region

Location	Name of off-taker	Core business	Value of assets (US$)	Production capacity	Capacity utilized
Karagwe	Karim Super Sembe	Processing of agricultural products (maize value chain)	826,086	10,000 MT/ month	6,000 MT/month
	KPD Plc	Beans off-taker	4.1 million	20,000 MT/ season	10,000 MT/ season
	Al Habssy Co. Ltd	Beans off-taker	47,300	800 MT/annum	500 MT/annum
	Zahoro Abdala	Beans off-taker	34,782	300 MT/season	170 MT/season

Location	Name of off-taker	Core business	Value of assets (US$)	Production capacity	Capacity utilized
Kyerwa	Alexander Rugara	Beans off-taker	78,260	400 MT/month	300 MT/month
Bukoba	Wilbroad Cyprian	Processing of agriculture products i.e., maize and cassava flour	65,217	300 MT/month	120 MT/annum
	Conwell Ngani	Processing of agriculture products i.e., maize milling, cassava milling animal feed processing	108,695	900 MT/month	400 MT/month
	Ludovick Milling	Processing of agriculture products i.e., maize and cassava flour	21,739	270 MT/month	180 MT/month
Missenyi	Joseph Nyasi Cosmas	Beans off-taker	469,800	6000 MT/ annum	5000 MT/annum
	Hillal Hamis	Beans and maize off-taker	17,391	300 MT/month	180 MT/month
	Haji Kulandela	Beans and maize off-taker	8,695	800 MT/season	200 MT/season
Muleba	Adolph Kyabona	Beans off-taker	137, 145	1200 MT/ annum	900 MT/annum
	SY Kyetema	Processing of agriculture products (i.e., maize milling, cassava milling and processing of instant coffee)	95,652	30O MT/month	200 MT/month
	Eric Samwel	Beans, maize and cassava off-taker	34,782	100 MT/month	70 MT/month
Ngara	Joseph Ssemuguruka	Maize and cassava processor	476, 190	2500 MT/ annum	2500 MT/annum
	Barongo Rusinda	Beans and maize off-taker	43,478	800 MT/month	300 MT/month
	Erick Patrick	Beans and cassava off-taker and exporter	21,739	200 MT/month	80 MT/month

Annex 5.4: Retail Agro-Dealers under Nyamiaga BSC in Ngara Disctrict

Name	Village	Ward
Justus Choya	Mayenzi	Bukiriro
Anold Kagaya	Chivu	Kirusha
Kibaden Nyamyanyi	Bukiriro	Murulama
Stanslaus Yusuph	Mabawe	Mukaliza
Musa Macharius	Kibimba	Kumtana
Maisha Deus Ntalonganyika	Kibogora	Kibobora
Nyavyuma Stephano	Mabawe	Mabawe

Name	Village	Ward
Seif Maulid	Kirushya	Chivu
Simon Juvinary	Kasharazi	Kasulo
Joseph Mabara	Murusagamba	Murusagamba
Joana Simon	Murukukubo	Murukukubo
Hamis Kanyerema	Murubanga	Nyamagoma
Syliverius Anatory	Muganza	Muganza
Yusuph Katura	Kumnazi	Kasharazi
Martoni Batenda	Kirusha	Kirusha
Bahati Bulele	Ntobeye	Ntobeye
Benard Mudogo	Bukirilo	Bukirilo
Brigthon Samwel	Nyamiaga	Nyamiaga
Essau Nyamaziga	Nyakisasa	Nyakisasa
Cyriro Kanyeremu	Kabanga	Kabanga
Selemani Soleimani	Nterungwe	Nterungwe
Amos mathias	Keza	Keza
Hassan Abul	Mwivuza	Mwivuza
Sagida Ntemi	Ngara	Ngara
Chizanye Ruzika	Ngara	
Jaskim Kabebo	Ntobeye	Kirusha
Jovit Mugisha	Rulenge	Rulenge
Azory Tirumanya	Benaco	Mugoma
Erick Sabinus	Mbuba	Mbuba
Philipo Mbinge	Kashinga	Kashinga
Regnard Pascal	Rusumo	Rusumo
Benja Alisen	Mikole	Mikole

Annex 5.5:

Enterprise	Commodity	Asset value (US$)	Annual turnover (US$)	Type of business
Edward Katunzi	Maize and beans	313,200	469,800	Offtaker
Anatoly Protase	Beans	62,640	93,960	Offtaker
Gidius Laurent	Maize and beans	146,160	219,240	Offtaker
Binamungu Lucas	Beans	94,825	133,565	Offtaker
Amani Hassan	Maize and beans	102,200	150,261	Offtaker

Enterprise	Commodity	Asset value (US$)	Annual turnover (US$)	Type of business
Blasio Machenche	Beans	69,120	98,770	Offtaker
Salvis Salvatory	Beans	72,100	98,800	Offtaker
Kurahishi Tibita	Maize and beans	103,305	137,740	Offtaker
Isaya Kasungu	Beans	46,150	63,652	Offtaker
Cyprian Joel	Maize and beans	150,250	224,350	Offtaker
Dalius Odilo	Maize and beans	152,650	195,700	Offtaker
Erick Samwel	Maize and beans	281,000	347,000	Offtaker
Mzamiru Musa	Beans	87,300	110,500	Offtaker

6. Enhancing Adoption of Improved Technologies for Increased Productivity and Trade Along Lake Tanganyika Corridor - Kigoma

Mizambwa D., Rweyendela V., Obare N., Njoroge L., Bigirwa G.

Key Messages

- The partnership with Tanzania Chamber of Commerce offered an opportunity to expand market access to the neighbouring countries of Burundi, Rwanda, and DRC, for both input and output markets.
- Kigoma Consortium strengthened input systems through the creation of demand for improved technologies and development of last mile delivery through innovative extension approaches. As a result of this, smallholder productivity increased for both maize and beans.
- By matching grant arrangements, agri-processing SMEs diversified their business lines, and expanded their processing and storage capacity, hence offering new marketing opportunities to smallholder farmers.
- Partnership with the local government authorities enhanced coordination and mobilization of additional resources to support critical areas such as extension service delivery. However, effective coordination of trade operations remained a challenge.

Key Words

technology adoption, crop productivity, cross-border trade, program coordination, trade corridor

Introduction

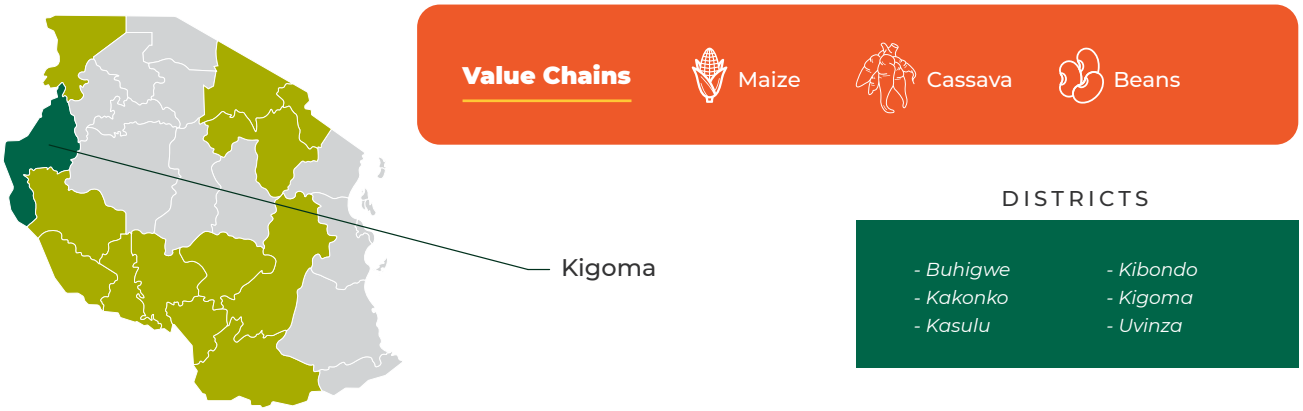


Figure 32: Kigoma Region map showing targeted districts

AGRA introduced the agribusiness consortium model to support the development of agriculture in Kigoma Region, which is located in western Tanzania along the shores of Lake Tanganyika and shares borders with Burundi and DRC.

The region covers 45,075 km^2 and is divided into 6 districts: Kigoma, Kasulu, Kibondo, Kakonko, Uvinza, and Buhigwe. The region's 2019 population estimate was 2.7 million, with an estimated growth rate of 3.1%. The population engaging in Agriculture was 943,417 while households engaged in agriculture were 315,366 (URT, 2020). The per capita income in 2017 was US$569, compared to the national average of US$1,122[10]. This makes Kigoma one of the low-income regions in the country (URT, 2017).

The climate is tropical and influenced by Lake Tanganyika, leading to high temperatures (20°C to 30°C) and humidity. The rainy season stretches from late October to May, with short dry spells of between two and three weeks in January or February. Annual rainfall ranges from 860 mm to 1,200 mm.

The Kigoma Consortium focused on the identified main food crops: maize, cassava, and beans. The aim of the consortium was to increase income and improve food security and livelihood among 170,000 smallholder farmers in four districts of Kigoma Region: Kibondo, Kasulu, Kigoma DC and Uvinza.

Table 13: Estimated production per unit area for Kigoma region 2018/2019–2020/2021 crop season

2018/2019			2019/2020		2020/2021	
Value chain	**Area (Ha)**	**Production (MT)**	**Area (Ha)**	**Production (MT)**	**Area (Ha)**	**Production (MT)**
Beans	151,003	352,284	149,358	193,792	133,912	208,057
Maize	330,420	1,003,759	307,272	717,913	308,519	825,358
Cassava	210,343	1,093,947	177,205	957,697	206,221	1,397,940

Source: Kigoma Region Secretariat (2021)

The main objective of this consortium was to strengthen input supply systems and linkages to output markets to facilitate the uptake of yield-enhancing agricultural technologies. Consortium investments focused on attracting and de-risking agribusinesses that were willing to invest in Kigoma's smallholder farming systems.

The consortium's investments leveraged existing agricultural development programs in the region., including:

a) Sustainable Agriculture Kigoma Regional Project (SAKiRP), supported by Enabel, the Belgian Development

10 World Bank national accounts data, and OECD National Accounts data files

Agency helped farmers to access the market and good quality seeds and planting material for beans and cassava, respectively. SAKiRP and the AGRA-supported consortium collaborated closely, especially in building the capacities of farmers and VBAs. This collaboration added great value to the two initiatives and created ownership of the VBA model at the local authority level.

b) Building an Economically Sustainable Seed System for Cassava in Tanzania (BEST Cassava), a four-year project funded by the Bill & Melinda Gates Foundation (2017–2021) implemented by MEDA, IITA, TARI, and the Tanzania Official Seed Certification Institute (TOSCI). The aim was to establish a commercial cassava seed system in Tanzania for smallholder farmers to ensure timely access to quality-assured, disease-resistant and higher yielding cassava varieties in the right quantities and at an affordable price.

c) Kigoma Joint Programme (KJP) implemented an agriculture support project under four UN agencies – FAO, WFP, United Nations Capital Development Fund (UNCDF) and International Trade Centre (ITC). The main components of KJP included extension, markets, access to finance and post-harvest management. The activities of the AGRA-supported consortium and the KJP program were implemented in a complementary manner, with KJP adopting the VBA model and expanding it to two more districts in Kigoma Region.

Coordination was strengthened through the following initiatives:

1. Joint coordination through the Kigoma regional secretariat has made delivery of services time-efficient and strengthened the collaboration between agriculture stakeholders.
2. Joint physical meetings, data exchange and information sharing enabled stakeholders to avoid duplication of efforts and improved resource utilization efficiency.

Structure of the consortium and roles of implementing partners

The Kigoma Consortium comprised the following partners:

a) Faida MaLi: A local NGO that provides business development services to SMEs and farmer organizations engaged in agricultural trade and food processing. Its role in the Consortium was to improve access to markets for smallholder farmers and build the capacity of SMEs.

b) Nyakitonto Youth for Development Tanzania (NYDT): A local youth NGO focusing on entrepreneurship, business training and extension. The organization's role in the consortium was to organize farmers into groups, provide extension services and farmer training.

c) Ruvuma Commercialization and Diversification of Agriculture (RUCODIA): A local NGO that offers extension services to farmers and farmer organizations with a focus on demonstrating new technologies. Its role in the consortium was to develop and strengthen agro-dealer networks that enhance the delivery of agricultural inputs and associated technologies for smallholder farmers.

d) Farm Radio International (FRI): An international NGO whose role in the consortium was to lead interventions in extension through interactive radio programs and other ICT platforms to enhance the adoption of agricultural innovations.

e) Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA): An industry association facilitating trade. Its role in the consortium was to work with government authorities and agribusinesses to promote an enabling environment and conduct business advocacy through public-private dialogues.

For more details on implementing partners see Appendix 6.1 for details.

Government engagement

The consortium worked with local government authorities at the regional and districts levels. This engagement led to improved collaboration between government extension agents, agribusinesses, and VBAs. Local government also played a key coordination role, including chairing meetings at district level and supporting input demand creation activities. The Kigoma Consortium signed an MoU with local government authorities to enhance accountability, transparency, and coordination. Specifically, the role of the local government included:

a) Provision of extension services in partnership with VBAs through demonstration plots, field days, and distribution of extension materials.

b) Sharing regular progress updates with the district management team and receiving feedback for improving performance within the consortium.

c) Backstopping technical, administrative and policy framework at the local level.

d) Carrying out joint field monitoring visits for verification and ascertaining value for money.

e) In collaboration with District Agriculture, Irrigation and Livestock Cooperatives Officer (DAICOs), regularly organizing sub-national agricultural working groups to review agricultural performance, address any constraints/bottlenecks preventing agricultural and market systems from functioning properly. This included scheduling input delivery, addressing disease outbreak, crop monitoring and production forecast, aggregation, marketing and seasonal performance evaluation.

The resident AGRA Program Officer was responsible for coordinating implementing partners and private sector actors in the consortium to upgrade agricultural value chains and expand market opportunities for smallholder farmers. The officer also collaborated with other agricultural development players to create synergies between AGRA-funded programs and other initiatives. Additional responsibilities included:

- Mobilizing private sector investments through agribusiness summits and other linkages to cross-border trade opportunities.
- Championing partnerships with key stakeholders such as Enabel, YARA, ETG, MeruAgro, and SubaAgro.
- Coordinating consortium engagements with the local government through the regional secretariat.
- Coordinating capacity building for grantees in data capturing, management and reporting.
- Monitoring, evaluating and supervising grantee activities.

Summary of outcomes vs investment

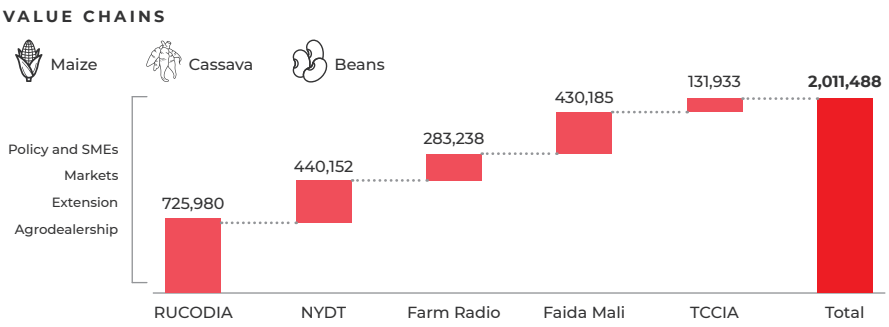
AGRA invested US$2.01 million to improve production systems in Kigoma, and attracted private sector investments in the key value chain segments. By the end of 2020, the maize, beans and cassava value chain actors had invested and realised transactions worth US$36.5 million, which is 18 times the direct budget. This value reflects investments in warehouses, input distribution systems, new processing facilities, post-harvest management equipment, loans to SMEs, and the value of produce sold. Figure 31 summarizes the value leveraged by the consortium.

Specifically, the consortium delivered the following outcomes:

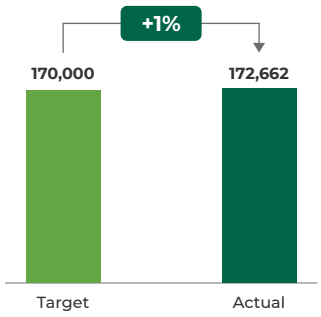
- Increased the use of improved technologies among smallholder farmers participating in the Kigoma consortium.
    - Fertilizer use increased from 1,983 MT in 2017 to 26,286 MT in 2020.
    - Use of certified seed for improved varieties increased from 205 MT in 2017 to 1,419 MT in 2020.
- Increase in productivity; for example, maize productivity increased from 3MT/Ha to 4MT/Ha for the farmers in the areas of intervention.
- 746 agro-dealers were trained in business management (523 male, 223 female).
- 527 agro-dealer linked with and helped to establish business relationships with input and/or output markets.
- Seven aggregation centres of about 7,181 m^3 and about 10,481 m^3 of storage facilities upgraded to meet buyer quantity and quality requirements.
- 52,555 MTs of forward contracts signed and honoured including for maize, beans and cassava.
- A total of 2,310 VBAs (1,032 females) recruited and trained.

Value leveraged by the Kigoma Consortium

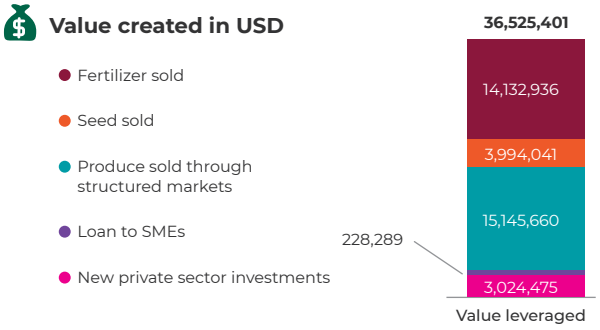
Implementing Partners and AGRA's Investments in USD



Number of farmers reached



Value created in USD



- The value leveraged is **18 times** AGRA's Investments.
- The use of fertilizer increased from 1,983MT in 2017 to 26,286 MT in 2020 and improved seed from 205 MT in 2017 to 1,419 MT in 2020.

Farmer-level impact

- **28%** of farmers have adopted improved technology and GAP.
- **31%** of farmers accessing structured market.

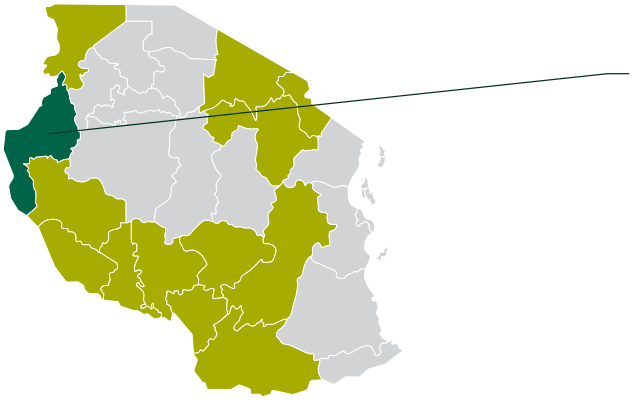
Business impact

- The value created was through fertilizer and seeds sold, selling produce through structured markets, loans accessed by SME's and new private sector investments in the consortium.

Figure 33: Value leveraged by Kigoma Consortium

Sustainability through Business Sub-Consortia

Sustainability of the Kigoma Consortium is indicated by emerging BSCs in Kasulu, Kibondo, Uvinza and Kigoma districts. This chapter describes two of the BSCs that are sustainable and operational, namely Kasulu and Kibondo. These are fully operational and are described in detail in the following sections. The remaining BSC still require support to attain sustainability.



Kigoma

BUSINESS SUB-CONSORTIA (BSC)

- Kasulu - Kibondo

Figure 34: Business Sub-consortia (BSC) under the Kigoma Consortium

Kasulu Business Sub-Consortium

This BSC is anchored on Kitutu Enterprises & General Supplies (Siha Sembe). It is a business partnership comprised of hub agro-dealers, processors of bio-fortified maize flour, off-takers, retail agro-dealers and farmers. The members of this sub-consortium are shown in Figure 32 and briefly described here.

Figure 35: Members and partners of the Kasulu Business Sub-Consortium

Off-takers

The main maize processors and off-takers are Kitutu Enterprises & General Supplies, Nabuhima Food, Ruango Traders, Kisoya Company, Gwakula Investment Group, SEBA Agrovet and Meshack Agrovet.

- Kitutu Enterprises & General Supplies is an off-taker and processor of biofortified maize flour under the Siha Sembe brand in Kasulu District. The company received a matching grant and increased its storage capacity from 50 MT to 300 MT. Kitutu further invested its own resources to tap into a new market in DRC. Its capacity to purchase farmer produce increased from 1,836 MT in 2018 to 3,211 MT in 2020. It established markets with public schools, army camps and retail shops in all the districts in Kigoma for its Siha Sembe products. Due to improved post-harvest handling and better aggregation arrangements, Kitutu increased the quantity of maize purchased within Kigoma Region, hence reducing its logistical costs.

  > *"Before AGRA's interventions, we used to source maize from Sumbawanga District, about 540km away," says Charles Makule, a director at Kitutu Enterprises. "Thanks to AGRA's support to farmers and through the support of the consortium, the quality of maize in Kasulu District has improved, and currently we source most of our maize grains locally."*

- SEBA Agrovet is a hub agro-dealer in the business sub-consortium with the role of supplying agricultural inputs. Before the advent of the AGRA-supported consortium, there were only 40 agro-dealers in Kasulu District, with poor business relationships. The SEBA and other agro-dealers in this BSC were beneficiaries of business development services. As a result, a network of 217 retail agro-dealers with excellent business relationships was established in Kigoma and Kasulu districts. This support further helped SEBA to increase its fertilizer sales from 500 MT in 2017 to 3,600 MT in 2020, while seed supplies increased from 18 MT in 2017 to 90 MT in 2020. A total of 16,870 farmers in Kasulu are benefiting through this established network.

- Meshack Agrovet is one of the retail agro-dealers in Kasulu District, which has expanded its capital investment from US$5,000 to US$12,957, an increase of 159%. The company provided services to more than 186 smallholder farmers and currently has a capacity of 7 MT of improved seed and 21 MT of fertilizer.

Box 8: Testimony by Meshack Dominik

"I appreciate the education and awareness given to farmers on the use of improved inputs that enabled me to expand my business within a span of three years. I have since constructed my own house in Kasulu, bought a motorcycle and a two-acre field."

- GIG Company Ltd is a maize flour processing enterprise in Kigoma with a current installed capacity of 7,000 MT. The company has a large share of the local market in Kigoma Region and plans to increase its storage capacity, diversify into rice milling, and extend exports to the DRC market. The amount of maize sourced from farmers supported by the consortium gradually grew from 700 MT in 2016/2017 to 3,780 MT in 2019/2020.
- Other off-takers participating in this BSC include: (i) Kisoya Sembe, based in Kasulu District and specializing in maize flour processing for the DRC market, with an installed capacity of 2,000 MT; (ii) Rwango Trader, which exports 1,200 MT of maize to DRC and Burundi annually.

Input supply

On the input supply side, the partners in this BSC included:

a) Large suppliers of inputs such as Yara and SeedCo, which increased their input supply after establishing relationships with the consortium.
   - Yara rented a warehouse with a storage capacity of 680 MT of fertilizer, charged at approximately US$6,000 per year. The annual turnover was approximately US$1.2 million for Kigoma only. It increased the quantity of fertilizer supplied from 1,983 MT in 2017 to 15,772 MT in 2020.
   - SeedCo increased the supply and quantity of seed sold from 10 MT to 50 MT in a period of three years and planned to grow sales to 100 MT in the 2020/2021 season. The estimated average turnover was about US$131,000.
   - Pannar, Corteva, Bytrade and Monsato/Bayer were other multinationals that were involved in seed supply.

b) Local inputs supply companies that were not operating in Kigoma until the establishment of the consortium became members of Kasulu BSC and included:
   - Suba Agro: The company invested in a bean seed farm in Kasulu and Kibondo and increased supply to Kigoma from 0.5 MT in 2017 to 3.3 MT in 2019.
   - Meru Agro: It invested in a Kigoma seed farm for maize. It increased seed supply from 5 MT to 12 MT in Kigoma, and plans to increase this the 2020/2021 season.
   - Beula: The company increased seed sold in Kigoma from 2 MT in 2017 to 6 MT in 2019.
   - IFFA Seeds: It increased seed sold from 7 MT in 2017 to 16 MT in 2019. It has a big market share in Kigoma.

c) Retail agro-dealers were also members of this BSC. The total number of retail agro-dealers in this BSC was 217. The prominent ones include:
   - Victor Nyatora: A male retail agro-dealer from Kasulu District who expanded his business and increased fertilizer supply from 4 MT in 2017 to 17 MT in 2019, while seed sales increased from 7 to 11 MT.
   - Rebecca Mayenje: A female agro-dealer from Kasulu District whose fertilizer and seed supply capacity increased from 5 MT and 3 MT in 2017 to 11 MT and 8 MT in 2019, respectively.

Extension services

Extension services in this BSC were provided by government agents and private extension workers hired by the anchor firm, Kitutu Enterprises & General Supplies. To ensure effective last-mile delivery, these extension agents worked with VBAs who also dealt with input supply.

Under this BSC, the total number of VBAs was 1,050 and some of them also provided agro-dealership services. The prominent ones include:

- Linus Dominiko: A farmer and VBA based in Nyakitonto village growing beans and cassava was trained on good agronomic practice and provided extension services to support 68 farmers within the village.
- Innocent Michael: A bean farmer who was trained in QDS multiplication at TARI Maruku. He has been trained in good agronomic practice and works with 90 maize and bean farmers in his village.
- Francis Kusoga: A VBA and small-scale agro-dealer has trained more than 120 farmers on the effective use of inputs and good agronomic practice. He has been helpful in providing extension services among his fellow farmers.

Box 9: Testimonial from Francis Kusoga, VBA and a retail rural agro-dealer

The consortium initiative has given Francis Kusoga the opportunity to open an agro-shop in his village. Although Nyakitonto District has the right climate conditions for farming, farmers used to travel long distances to the main towns to buy improved seeds, agro-chemicals and fertilizers.

"We did not have agro-dealers in the wards and villages," he recalls. "Many farmers opted for traditional agriculture more often than not because getting modern inputs and improved seeds, fertilizers and pesticides was a tall order." The situation discouraged young people from farming, and those in the trade did it for lack of other options.

"The lack of agricultural inputs at the local level became a business opportunity for me and others to become agro-dealers," he adds. "We make it possible for farmers to get their inputs – improved seeds, agro-chemicals and fertilizers – closer to their localities." In addition, consortium interventions have helped the new agro-dealers to become extension services providers, a free service which keeps bringing customers back to make purchases to support the success of their farming enterprises.

Farmers

This BSC served 16,870 smallholder farmers from Kabulanzwili, Mpeta, Tekenya, Kipanga, Nyakitonto and Kanazi villages. The farmers adopted good agronomic practice and are used improved inputs.

In terms of the sustainability of this BSC, the early indicators include:

a) Some farmers (mostly those who double-up as VBAs) have started re-investing profits to purchase improved inputs and are also diversifying their sources of income by engaging in off-farm activities such as general shops, and becoming local agents of telecommunication companies and banks. The profits from these activities are used to grow their investments in agriculture. As a result, maize yield increased from 1.5 MT/ha in 2017 to 4.0 MT/ha in 2019, while bean yield increased from 0.5 MT/ha to 1.5 MT/ha in the same period.

b) Input and output market players are expanding physical infrastructure and human resources by investing in new warehouses, and hiring local level and permanent field staff. Yara and SeedCo, for example, have staffed their field operations under such arrangements. This is an indication of sustainability.

c) The increment in processing capacity has expanded demand for farmers' produce. There is an observed doubling in processing capacity and expansion of warehouses by the private sector operators.

d) Repeated transactions among buyers and farmers are a strong indicator of sustainability due to good business relationships among players. Some of the off-takers offer storage services to farmers with options to be priority buyers when they decide to sell.

Kibondo Business Sub-Consortium

This BSC is anchored on Nabuhima Food Company Ltd, a maize processor operating in Kibondo District. The BSC brings together input companies, hub agro-dealers, retail agro-dealers, VBAs, AMCOS, traders and local processors, large processors and exporters. As illustrated in Figure 33, all these private sector companies worked together to deliver services to 10,132 farmers growing maize, beans and cassava in Kumuwasha, Busunzu, Lugunga, Kitahana, Kagezi and Bitale villages.

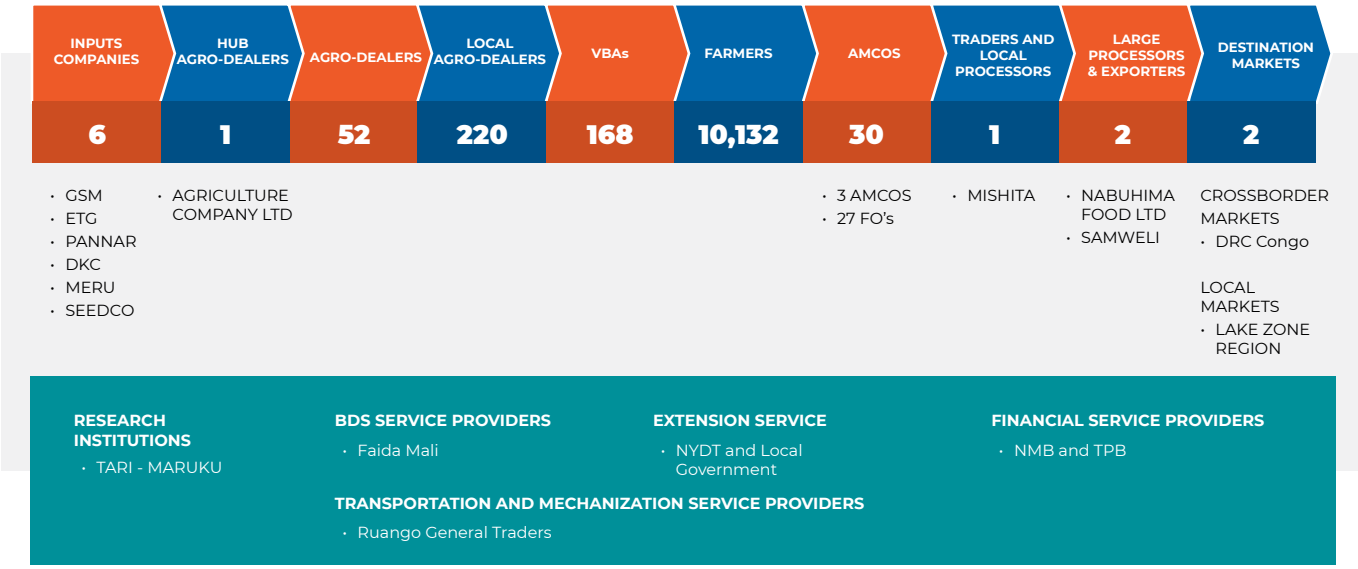


Figure 36: Members and partners of the Kibondo Business Sub-Consortium

Off-takers

Through its participation in this BSC, Nabuhima Food increased its storage capacity from 100 MT in 2017 to 300 MT in 2020. The company has a capacity to process 7,500 MT/year and improved business relationships with producers have enabled it to enhance its capacity utilization. For instance, in 2017 the company was buying 1,232 MT, but by the end of 2019/2020 it had increased purchases to 4,160MT.

To capture the market opportunity in DRC for the supply of high-quality grain, the company invested US$36,000 to rehabilitate its warehouse and improve the storage area. The AGRA-supported consortium de-risked this investment through a matching grant facility.

Box 10: Testimonial by Arron Joti Mwimo

"The AGRA matching grant facility was the most impactful support that facilitated the expansion of my businesses," said Arron Joti Mwimo, the CEO of Nabuhima Food Co Ltd. *"By the end of 2020, I had opened another line for cassava processing in addition to maize. The improvement in processing infrastructure attracted additional capital from other partners to the tune of US$50,000."*

Other off-takers for this BSC included:

- Fabiano, who supplies 8,700 MT/year of maize to both export and domestic markets. Fabiano's customer base has expanded beyond Kigoma and now includes the lake zone of Tanzania and cross-border markets of Burundi and DRC.
- Samweli, who sells maize to the lake zone and Burundi and has the capacity to supply 7,700 MT/year.
- Pastory & Mishita, who supply 550 MT to 600 MT/year to the local market in Kigoma.

Input suppliers

Agriculture Company Ltd, a hub agro-dealer under this BSC, had the role of supplying agricultural inputs. In 2018/2019 it supplied 150 MT of fertilizer for beans and maize production. By the end of 2020, the company was supplying 400 MT of fertilizer and has plans to expand capacity to 1,000 MT.

From the above details and examples, Kibondo BSC has shown good results in market-led interventions and business sustainability. The increasing demand for maize and beans in both domestic and cross-border markets has led to the expansion of input businesses. In the process, smallholder farmers access to training, inputs, and other technologies has grown to meet market demand.

Box 11: John Dismas Dabali, Kigoma

John is a VBA turned agro-dealer in Mayange village, Kigoma. He sells seeds, fertilizers, agricultural chemicals and implements. He also provides free agricultural advice services to smallholder farmers around Mayange village to help them increase their yields. Through the Strengthening Agro-Dealers Network project in 2017, John was selected as one of the farmers to set up demonstration plots in his village promoting improved technologies. In late 2017, when the Kigoma Consortium started implementing the Strengthening Smallholder Farmers to Increase Productivity and Increase Income project, John was selected as a VBA and trained in GAP and business skills/entrepreneurship. In November 2018 he was trained on agro-inputs business management and established his shop with about TZS350,000 (~US$ 150.93) in capital. Now, the business's turnover is TZS900,000 per month (~US$389). Other than serving his village, John also supplies inputs to neighboring villages, bringing the total farmer count to about 300. He is keen on ensuring that farmers in Mayange village get quality inputs at the right time and within reasonable costs.

"I once had a challenge as I lacked the necessary permits to conduct an agro-inputs business. I am thankful to RUCODIA for supporting and facilitating me towards achieving regulatory compliance having trained with TFRA, TPRI, and TOSCI. My capital has increased from TZS350,000 (~US$ 150.93) to TZS1,500,000 (~US$ 646.83)," says John. "I receive some of the inputs on credit, but on a personal level the business has enabled me pay secondary school fees comfortably for my two children."

Weaknesses and Opportunities for Improvement

- A good number of traders in Kigoma depend on supplying neighbouring countries along the Lake Tanganyika trade corridor. However, the regional secretariat does not have harmonized procedures to issue permits to transport agricultural commodities. This has led to delays at the port and increased post-harvest losses. Therefore, the management of the consortium should coordinate with the regional secretariat to ensure free movement of goods. Partnerships with industry associations can also enhance this coordination through advocacy.
- Simplified and transparent cross-border trade procedures facilitate small traders to access cross-border markets. However, this regime has not been adopted at most border points linking Kigoma-based traders to neighbouring countries. To expand market and trade opportunities for traders and processors participating in the Kigoma Consortium, stakeholders should advocate trade facilitation arrangements between key neighbouring countries along the Lake Tanganyika trade corridor (DRC, Burundi, and Zambia).
- Even though implementing partners included the local chamber of commerce, most implementing partners did not have skills and experience in supporting SMEs and cross-border trade. This restricted access to potential sources of finance, business development services, and larger markets. Going forward, consortia should include implementing partners with expertise in identified gaps and pressing needs.

- Whereas Kigoma is linked to the rest of the country via railway, most productive areas in the region do not have access to improved feeder roads, storage and processing facilities. There's a need to invest in agro-processing industries in Kigoma to add value to agricultural products and fully harness cross-border trade opportunities.

Conclusion

The operations of the Kigoma Consortium have enhanced private sector investment in input distribution, storage, output markets, and processing facilities. However, these investments are still low and more is needed to accelerate the adoption of technologies and market linkages to fully exploit existing trade opportunities. Improved partnerships between agribusinesses and local government authorities could further enhance Kigoma farmers' integration in regional markets and supply food processors in the neighbouring countries of Burundi, DRC and Rwanda.

This consortia intervention also facilitated a platform for public-private sector dialogues both at regional and district levels through the business councils to address challenges affecting agribusinesses in the region such as commodity levies. Despite these achievements, a number of weaknesses were noted during the implementation of the program, including weak coordination with trade promotion officials, limited capacity of market infrastructure, and lack of expertise in impactful areas such as SME and trade development.

Acknowledgements

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Annex 6.1: List of Ongoing Projects in Kigoma

Development partner	Name of partner's project	Value chain	Aspect being addressed	Organization implementing the project
Enabel	Sustainable Agriculture Project (SAKiRP)	Bean and cassava	Supporting beans and cassava value chain	Enabel and LGAs
Bill and Melinda Gates Foundation	BEST Cassava	Cassava	Establishing affordable commercial cassava seed system	MEDA, IITA, TARI Maruku
FAO/WFP/ UNCDF/ITC	Kigoma Joint Programme	Beans and cassava	Agriculture support project in Kigoma	FAO/WFP/UNCDF/ITC and LGA

Annex 6.2: Kigoma Consortium Members and Responsibilities

Value chain component	Implementing partner and key skill sets	Contracted outcomes	Contracted outputs
Markets, trade, primary handling, and aggregation	• FaidaMali: Works with farmer organizations in mobilization and sensitization to tap into business opportunities. Its role in the consortium was to improve access to markets and to build capacity of SMEs • Faida Mali has experiences in community mobilization & sensitization for business opportunities, organizing farmers into groups and apexes and building their capacities in different aspects	• Increased access to improved crop storage infrastructure • Increased use of improved post-harvest technologies and practices by smallholder farmers • Increased use of structured markets	• 37,629 smallholder farmers linked to market – both anchor buyers and local alternative markets • 7 aggregation centers of about 7,181 m^3 and about 10,481 m^3 of storage facilities upgraded to meet buyer quantity and quality requirements • 52,555 MT volume based forward contracts signed and honored, including maize, beans and cassava • Total volume aggregated per crop are maize 33,994 MT, beans 7,442 MT and cassava 11,119 MT • 7 smallholder-managed warehouses equipped with moisture meters and weighing scales • 22,684 farmers trained in post-harvest management and new technologies available for post-harvest management • Distribution and acquisition of technologies, particularly among smallholder farmers facilitated and 2 post-harvest technologies demonstrated

Value chain component	Implementing partner and key skill sets	Contracted outcomes	Contracted outputs
Modernizing farming for smallholder farmers and technology dissemination	Nyakitonto Youth for Development Tanzania (NYDT): • Widely networked • Large membership and a large number of young supporters in their field of activity • Its core competence is in organizing farmers in viable groups and empowering them, including the youth farmers	• Increased smallholder farmers' adoption of target improved production technologies and management practices at farm level	• 28 extension service events completed • 136,572 farmers participate in AGRA supported extension services • 172,661 farmers reached with promoted interventions (101%) • 19,967 small packs distributed (number of small packs distributed) • 3,080 extension materials distributed (number of extension materials distributed) • 168 learning centers established around the demonstration plots • 14 agricultural exhibitions/seed and technology fairs conducted • 2,170 VBAs recruited and trained
Building inputs supply system	RUCODIA: Offers extension services to farmers and farmer organizations with a focus on demonstrating new technologies. Its role in the consortium was to develop and strengthen agro-dealer networks that will enhance delivery of agricultural technologies to farmers. The other skills set is from the IBB Project, which was implemented in the consortium with SNV and ACTN. RUCODIA implemented similar assignments: activities designed to establish and strengthen capacity of agro-dealers and farmer organizations	• Improved business management practices • Increased access to improved inputs by smallholder farmers	• 8 seed companies and 3 fertilizer companies were linked to agro-dealers • 57 hub agro-dealers established and strengthened • 202 new rural retail agro-dealers developed and supported through matching grants • 86 farmer organizations accessing inputs through aggregated demand • 746 agro-dealers trained in business management (523 male, 223 female) • 527 agro-dealers linked with and helped to establish business relationships with input and/or output markets • Suppliers credit facilities created • 8 agency agreements signed between the companies and agro-dealers • New products handled by the agro-dealers

Value chain component	Implementing partner and key skill sets	Contracted outcomes	Contracted outputs
Technology dissemination through mobile and media platform	Farm Radio International: FRI leads interventions in extension through interactive radio programs and other ICT technologies to increase uptake of agricultural innovations. Experienced in various interventions under ICT for agriculture	• Increased farmers' awareness on improved seed and associated technologies • Increased adoption of agriculture productivity enhancing technologies	• 1,635 farmers were interviewed to get their opinions on good agronomic practices • 6 broadcasters were trained on how to use Uliza interactive software • 1,635 smallholder farmers participated in discussion on good agronomic practice, post-harvest handling and market segment on maize beans and cassava • 17,531 total Uliza interactions of farmers responding to a poll question • 347 farmers (229 women and 118 men) participate in community listening group strengthening • 208 episodes have been reviewed, commented on and aired
Cross-cutting services – BDS; finance and policy	TCCIA: Strive to empower communities and SMEs with basics to run profitable business, negotiation skills and contracting arrangements. Main role is policy advocacy to remove administrative (NTB's) and policy constraints	• Increased agricultural employment and entrepreneurship • Strengthened and expanded business development, financial and risk management services in agriculture value chain	• 42 policy advocacy convenings and roundtables organized to improve advocacy efforts by key policy and regulatory stakeholders • 1,262 individuals participate in policy advocacy convenings and round tables (including Tanganyika Business Summit) • 18 trainings conducted on basic financial literacy for agro-based SMEs (selected processors and buyers) • 249 SMEs/individuals have received AGRA supported short-term agriculture sector training

7. Thematic Programs in Support of Agribusiness Consortia: Post-harvest Management

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Key Messages

- Loss reduction initiatives are more effective when they take an integrated approach that addresses knowledge, finance, policy and technological gaps. Post-harvest management should be holistic and address the whole value chain and its actors.
- Trading and processing SMEs are strategically placed in the middle of agricultural value chains. They have the potential for significant impact at both ends of the value chain.
- There is an interdependence between various segments of agricultural value chains, therefore, financial products should be designed comprehensively to also cover agricultural production inputs in addition to post-harvest handling technologies such as threshers, grain cleaners, dryers, processing machinery, tractors, ploughs and tillers.
- To enhance trust and transparency along the supply chain, village-level aggregation centers should be integrated into buyer business models and logistical setup to ensure effective transfer of post-harvest loss risks to actors with appropriate grain handling capacity.
- Food quality is a public health issue that cannot be left to smallholder farmers alone. There is need for consumer protection and awareness on quality standards for agricultural products.

Key words

post-harvest losses and technologies, matching grants, market demand, crop aggregation, hermetic storage solutions, forward delivery contracts

Introduction

In addition to the AGRA-supported consortia providing end-to-end solutions for smallholder farmers in specific geographies, AGRA Tanzania invested in thematic programs that addressed constraints in specific segments of the value chain. The selection of the segments focused on the weakest link in key systems and value chains. In Tanzania, poor quality of produce and high levels of post-harvest losses were major constraints preventing value chain actors from realising economic value for their enterprises.

To alleviate these challenges, AGRA and its partner, the Rockefeller Foundation, devloped YieldWise, an initiative that focussed on reducing postharvest losses in Tanzania.

YieldWise Food Loss Reduction Initiative

Agricultural value chains are changing rapidly, with transactions increasingly based on chains that involve coordinated links between farmers, traders, processors and retailers (FAO, 2007). The lack of access to consistent and viable markets for smallholder farmers is the primary root cause of post-harvest loss and is pivotal to the improvement of livelihoods.

Statistics from FAO show an upward trend in food production in Africa (Jayne & Sanchez, 2021). Producing food utlises a huge amount of land, water and energy. As food goes to waste, the energy and resources it takes to grow, harvest, transport, and package it also goes to waste. In the event that food waste goes to the landfill and rots, it produces methane – a greenhouse gas even more potent than carbon dioxide. According to the ***Driven to Waste: Global Food Loss on Farms*** report by the World Wide Fund (WWF) shows that 10% of global greenhouse gas emissions are linked to food loss and waste. The report further reveals that 1.2 billion tonnes of food are lost during and after harvest, globally. This is equivalent to 15.3% of food produced.

In sub-Saharan Africa, farmers experience high levels of post-harvest losses valued at $4 billion per year (World Bank, 2011). These losses disadvantage value chain actors as they reduce marketable volumes for farmers and lead to higher food prices for consumers. The benefits of agricultural intensification cannot be achieved in the absence of capacity to preserve and market excess production. Investing in food loss reduction efforts presents an opportunity to deliver increased incomes, better health, and a sustainable environment.

Together with the Rockefeller Foundation, AGRA designed the YieldWise initiative in Tanzania as an integrated solution to address post-harvest losses. To do so, YieldWise integrated five key priority interventions: increasing the demand for high-quality produce, farmer aggregation and training, access to finance, scaling up adoption of post-harvest handling technologies, prioritizing loss prevention and knowledge management (Rockefeller Foundation, 2020).

> “In Tanzania, domestic food production is sufficient to meet national food needs. However, some of the regions suffer perennial food shortages due to inherent weaknesses in logistics and post-harvest systems, which lead to higher food prices, because of decreased food supply. The magnitude of post-harvest losses is estimated to be 30%–40% for cereals and even higher for perishable crops.”
>
> **Eng. Mathew J. Mtigumwe (2019), the then Permanent Secretary of Ministry of Agriculture Tanzania**

The intervention sought to reduce post-harvest losses in Tanzania’s maize value chain by half by 2019, and increase the incomes of smallholder farmers by 15%. The planned scale of impact was to mobilize and train 200,000 smallholder farmers to aggregate 250,000 MT of maize over the three-year period.

To reduce post-harvest losses in Tanzania, AGRA intervened at three levels:

a) **Farmer level** – by building producers’ capacity to address the causes of post-harvest loss, and facilitating the acquisition of post-harvest management technologies.

b) **Systems level** – by supporting the development of market systems in the provision of post-harvest handling services, technologies and investment in grain handling facilities.

c) **National level** – the initiative worked with various stakeholders and the government of Tanzania to address policy related barriers that prevent value chain actors from adopting improved post-harvest management practices and private sector investment.

Specific actions that were undertaken under each of the three levels are described in subsequent sections.

Theory of change

Supply must be met by market demand or else farmers will have no incentive to produce more or adopt post-harvest technologies for reducing food waste.

Our approach, therefore, focused on building private sector partnerships to provide the tools, knowledge and markets for smallholder farmers and SMEs. This was important because business relationships avoid waste and losses. Our approach helped both actors to see financial value from their roles in reducing food losses. The initiative invested in post-harvest management, marketing, supplier relationships, and procurement systems to satisfy its customers and thereby create a market for the crop that smallholder farmers produce.

YieldWise strengthened farmers' agricultural and business skills and helped them organize into farmer groups to access inputs and finance, facilitate transactions with buyers, and improve their bargaining power. Figure 34 shows how the link between market demand and aggregation of farmers' supply creates the primary point of connection for pulling in technology and finance:

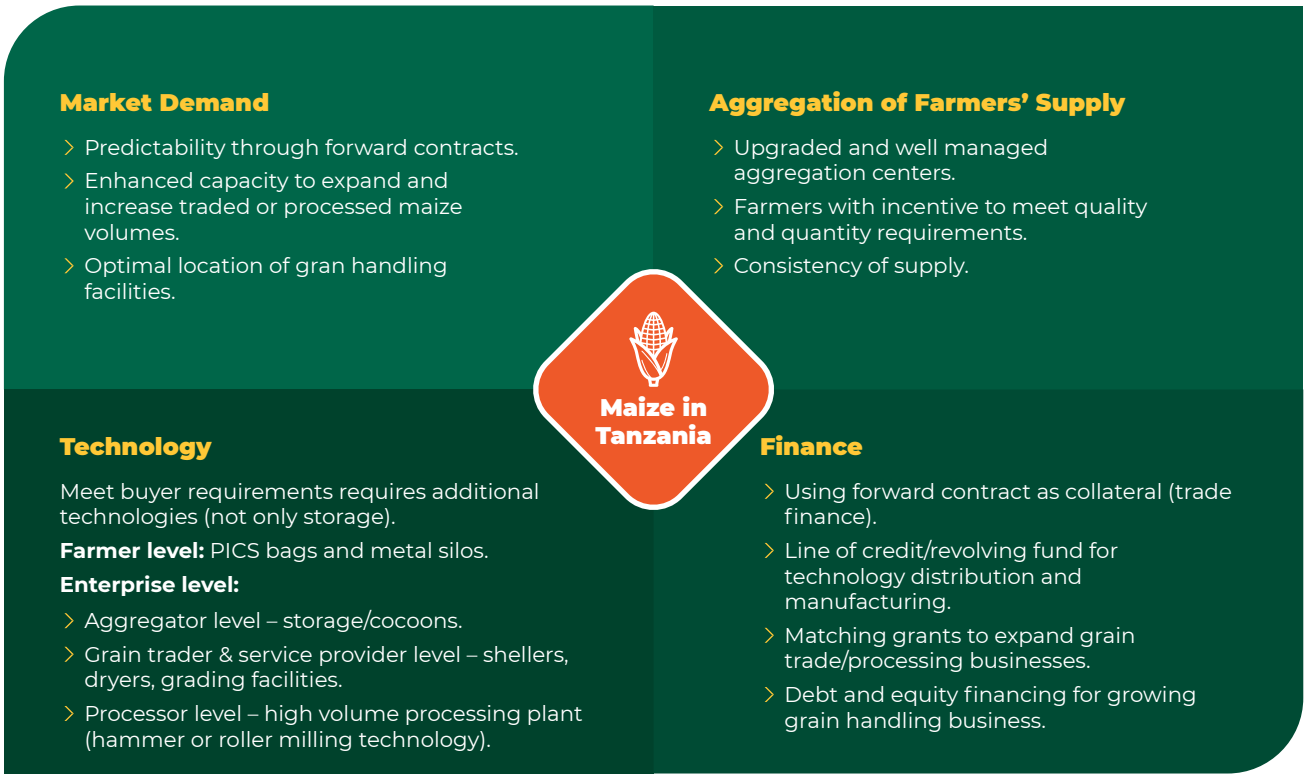


Figure 37: YieldWise theory of change

Geographical coverage

Initially, YieldWise focused on three primary regions in the Southern Highlands that have high production: Iringa, Njombe and Mbeya. In addition, the initiative covered four more regions along the central and northern trade corridors: Dodoma, Manyara, Kilimanjaro and Arusha. These regions are home to many grain handling companies, and have good infrastructure and improved access to markets.

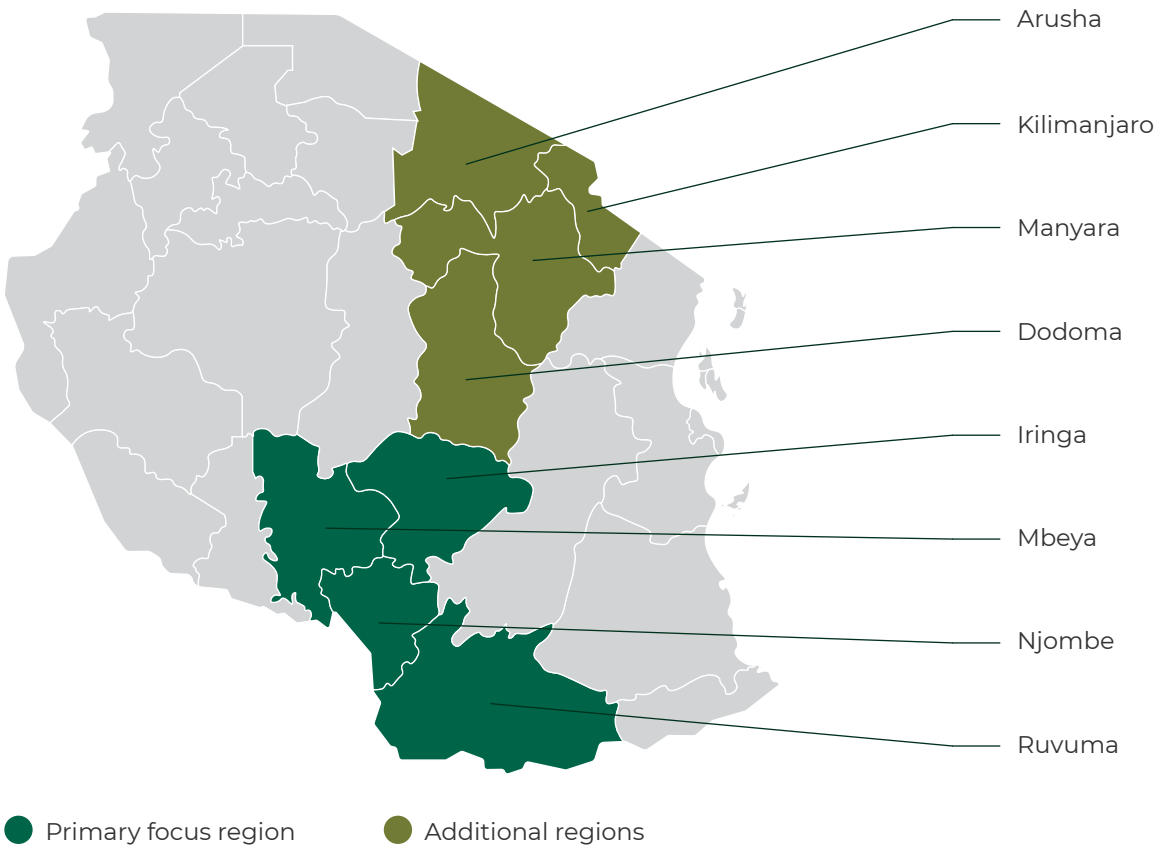


Figure 38: YieldWise focus regions

YieldWise implementation structure

The implementation of YieldWise took a consortium approach, bringing together grain traders and processors, farmer groups, financial institutions, manufacturers, and distributors of post-harvest management technologies. Input companies indirectly participated in the consortium to exploit the opportunities that it presented. Existing platforms such as FtMA and AGRA, which supported the consortia, also leveraged this investment in post-harvest management.

The Government of Tanzania used this initiative as a springboard for developing a national post-harvest management strategy. In addition, the National Food Reserve Agency (NFRA) piloted hermetic solutions, especially cocoons, to increase its storage capacity. AGRA also worked with IPSOS Tanzania as an M&E partner with the responsibility of managing all surveys at baseline, mid-line and end-line. Details of the roles and responsibilities of these partners are outlined in Table 14.

Table 14: YieldWise partners and their roles

Value chain component	Partner	Roles
Markets and trade	Center for Sustainable Development Initiatives (CSDI)	Develop capacity of SMEs and mobilize off-takers or buyers; work with manufacturers of post-harvest technologies as well as agro-dealers and/or technology distributors; facilitate financial linkages for SMEs

Value chain component	Partner	Roles
Farmer groups, training and aggregation	Building Rural Incomes Through Entrepreneurship (BRiTEN)	Mobilize and aggregate farmers, and train and build capacity of farmers in post-harvest management and good agricultural practices. Other roles included: supervise aggregation and link farmers to markets, and promote access to finance for farmers
	Rural Urban Development Initiatives (RUDI)	Mobilize and aggregate farmers, and train and build capacity of farmers in post-harvest management and good agricultural practices Other roles included: supervise aggregation and link farmers to markets and promote access to finance for farmers
Financing	Tanzania Agricultural Development Bank (TADB)	Provide loans to SMEs for the purchase of steel silos with minimum storage capacity of 500 MT and or maize milling machines with capacity of milling 30 MT per day (8 working hours) to improve storage and processing capacity
	TPB Bank Plc (recently renamed Tanzania Commercial Bank)	Provide working capital through revolving loans to SMEs to import, manufacture and/or distribute post-harvest technologies in Tanzania, which include hermetic bags, metal silos and cocoons
	Equity Bank Tanzania	Provide working capital through revolving loans to SMEs to import, manufacture and/or distribute post-harvest technologies in Tanzania, which include hermetic bags, metal silos and cocoons
	Innovare Finance PCC	Test and develop an asset lease finance product that supports post-harvets loss reduction; expand the breadth and depth of financial agricultural services; and increase lending and growth of customer base for financial institutions.
Post-harvest technologies	Pee Pee Tanzania Limited (PPTL)	Train and distribute post-harvest management products such as hermetic bags, silos, tarpaulins
	A to Z Textile Mills Limited	Train and distribute post-harvest management products such as hermetic bags, silos, tarpaulins

Value chain component	Partner	Roles
Enabling environment	Government	Overall coordination of post-harvest management is vested in the Ministry of Agriculture. The ministry played the role of the lead sector ministry as it does in cross-cutting initiatives such as ASDP. YieldWise worked closely with the Harvest Management and Processing Section, National Food Security Division (DNFS), whose roles were: • Develop, monitor, review and provide guidelines on food crops handling and backstopping services • Develop, review and provide guidelines and backstopping services on food storage facilities and structures • Develop and disseminate technical packages on food crops processing and preservation and monitor their implementation • Provide post-harvest advisory services on food crops processing • Provide post-harvest advisory services, including nutrition, based on food crops • Promote utilization of food crops, including drought tolerant crops • Prepare and disseminate food quality and standards and monitor their implementation • Build capacity of LGAs on post-harvest management and processing • Analyze and prepare reports on opportunities for private sector investment in food crops processing

BRiTEN was also an implementing partner in the Ihemi-Ludewa and SUKA agribusiness consortia, which made integration of post-harvest interventions seamless. Locally based financial service providers such as TADB, TPB Bank Plc (Tanzania Commercial Bank), Equity Bank Tanzania and post-harvest technology suppliers PPTL and A to Z Textile Mills provided services and products across all geographies covered by the agribusiness consortia.

Partnership with other Existing Platforms

Farm to Market Alliance

Farm to Market Alliance (FtMA) is a public-private sector consortium of six leading agro-businesses and institutions aimed at making markets work better for smallholder farmers. FtMA members are Bayer, Syngenta, Rabobank, Yara, WFP and AGRA. The consortium employed a comprehensive value chain approach to transform existing agricultural practices through four strategic pathways:

- access to predictable markets
- affordable finance
- quality farming inputs
- effective post-harvest handling, storage and other agricultural technologies

FtMA's mission is to create a thriving and sustainable agricultural sector that empowers farmers, forges strong markets and improves global food security. It supports African farming families to transition to commercial agriculture. FtMA uses a demand-led approach in servicing smallholder farmers and the surrounding ecosystem. Through its platform, smallholder farmers enter into stable selling relationships with buyers, typically through contracts extending beyond one season, and use this stability in demand to access finance and loans used for seeds, fertilizer and other technologies.

YieldWise Tanzania partnered with FtMA to implement the project in 18 districts across the country to build market pull for smallholder farmers and address input access challenges. The partnership with FtMA enhanced YieldWise's service offering as its initial design did not include access to inputs. YieldWise's footprint also enabled FtMA to intensify its operations in the Southern and Northern Highlands. As a result, farmer maize productivity more than quadrupled in most areas, from an average of 500 kg per acre to 2,200 kg, with more progressive farmers achieving 3,000 kg per acre.

AGRA-supported agribusiness consortia

The YieldWise initiative leveraged AGRA-supported agribusiness consortia that were offering integrated solutions to farmers in the Southern Highlands. These consortia brought together agribusiness actors dealing in seed, fertilizer, agro-dealership, extension, grain handling and processing. YieldWise mostly capitalized on the presence of hub, retail agro-dealers and VBAs to build a wide distribution network for post-harvest loss reducing technologies. At the same time, financial institutions working with YieldWise increased lending to agri-food SMEs and agro-dealers using the YieldWise matching grant facility and revolving fund. By the end of 2020, these financial institutions had disbursed US$10M to SMEs and agro-dealers who used these loans to increase their stock levels of post-harvest management technologies, especially hermetic storage bags. Grain traders and processors used the loans to acquire improved food processing technologies such as maize milling machines, threshing machines and metal silos.

Performance and Outcomes

Market demand

AGRA mobilized 44 grain traders and processors who were willing to pay for quality and reconfigure their supply chain to provide post-harvest management services to smallholder farmers. The 44 off-takers integrated 200,323 smallholder farmers into their supply chains. The premium prices paid by these off-takers incentivized smallholder farmers to adopt and invest in improved post-harvest management technologies.

Within YieldWise, there were two types of buyers: Anchor buyers who were buying produce through forward delivery contracts (FDCs) and alternative buyers who had non-contractual trading relationships with farmers. Both buyers were introduced to the participating farmers. Figure 39 illustrates these different levels of intervention.

Source: Adopted and updated version of the "intended end state" Rockefeller Foundation, 2015

Figure 39: End state of the maize value chain in target regions

YieldWise also worked with maize millers and agricultural marketing cooperative societies (AMCOS) to promote the provision of storage services to farmer organizations. Through the initiative, aggregators and processors accessed a matching grant facility that enabled them to increase their storage capacity. AMCOS members also received training on proper post-harvest management to meet market quality standards. A combination of these interventions enabled both actors to trade with the necessary information and capacity to handle large volumes of grain while maintaining quality standards.

The 44 grain traders and processors that supported the initiative had an installed capacity of 670,500 MT per annum and utilization of only 45% (301,725 MT), largely due to market growth constraints. Since 2017, YieldWise has facilitated farmers to aggregate and sell 287,518 MT of maize to the different buyers introduced by the project. Table 15 summarizes the maize volumes aggregated and sold since 2017.

Table 15: Volume of maize aggregated, and losses prevented during implementation of YieldWise program

	2016/2017[11]	2017/2018	2018/2019
Cumulative volume of maize aggregated (MT)	34,906	249,907	287,518
Losses prevented (MT)	2,792	9,996	31,627
Economic value of loss prevented ($)	561,742	1,405,452	4,798,198

Source: End-line Evaluation of the YieldWise Initiative: Analysis of Post-Harvest Loss of Maize Produce Among Small Holder Farmers in Tanzania, 2020

In 2017/2018, YieldWise engaged alternative non-contract buyers was a mitigation to the risk of contracted buyers not honoring their obligations with farmers. In some cases, some farmers also failed to meet their side of the bargain, while others preferred cash transactions over deferred payments by contract buyers. A key lesson learnt here is that both farmers and buyers violate contracts whenever market prices favor them. When market prices are lower than contract prices, as happened in 2018, buyers are ready to "side purchase" where farmers are not willing to negotiate prices downwards. When market prices are higher than contract prices, as happened in 2017/2018, farmers are ready to "side sell" if buyers are not willing to negotiate prices upwards.

In the same year, YieldWise expanded into Kiteto, Manyara Region, where the project worked closely with MEMA Holdings to secure a market for maize farmers in the area. MEMA Holdings has installed a steel silo with a capacity of 2,000MT in the area which will be used to store farmers' produce at a fee and support grain handling for the company's factory in Dar es Salaam and other processors. The long-term plan is to extend the storage, handling and cleaning facility to 10,000MT. This will provide YieldWise-supported farmers in Kiteto and neighboring districts

[11] This was the first year of YieldWise initiative in Tanzania

with market opportunities for surplus maize.

Smallholder farmer training and organization

The initiative provided training for smallholder farmers to identify and grow maize varieties that are demanded by the market. Training mainly focused on agricultural practices, including post-harvest management to improve the overall production quality and reduce post-harvest loss. These trainings were organized by YieldWise and conducted by the private sector partners who are in the business of farm inputs and post-harvest technologies.

Farmers, through their groups and organizations, were supported to access post-harvest handling equipment such as moisture meters, weighing scales, tarpaulins and metal silos. The initiative worked directly with 311 farmer organizations in the focus regions. The organizations have a significant presence in their communities, and if they are strengthened, they can be used to expand agriculture services to farmers across different value chains. Key services that these organizations and AMCOs provide to farmers are input demand aggregation and bulk supply, storage services, provision of market information, tractor hire services and market access for a wider range of crops such as beans, sunflower, and rice. Most of the organizations and AMCOs own storage facilities with capacity ranging between 100 MT to 300MT. This existing infrastructure can be leveraged by other actors to promote efficient near-farm aggregation.

Farmer field days were also conducted in collaboration with input companies such as Seedco, Meru Agro, Yara, ETG, Silverlands and Kibo Trading. Government extension officers such as District Agriculture, Irrigation and Livestock Cooperatives Officers , District Inputs Officer, Ward Agricultural Extension Officer, Village Executive Officer also participated at these events. The field days were used as a platform to demonstrate and promote new technologies, provide farmers with critical information on uses and application as well as create business relationships with input companies.

By the end of 2020, the cumulative number of farmers organized and trained for collective marketing was 200,323. Private sector companies in farm input business have deployed sufficient personnel on the ground to continue providing trainings for farmers through demonstration plots and farmer field days. This will ensure that farmers continue to access knowledge and quality inputs at points of sale.

Access to finance

YieldWise financing solutions focused on SMEs involved in trading and processing, agro-dealers distributing post-harvest technologies, and input loans to farmers. This ensured adequate investment by all actors and capacity preparedness at all levels of the maize value chain. The project directly engaged banks (commercial and development banks), and leveraged partnerships such as FtMA. The aim was to increase access to finance, enabling SMEs and farmers to invest in post-harvest management technologies and other farm inputs.

Finance for maize traders and processors

YieldWise partnered with TADB, a development bank to provide loans to SMEs keen to invest in the purchase of steel silos. The following was the criteria:

1. Where applicable, the SME shall have its main business operations in Tanzania.
2. The Loan shall be utilized in Tanzania.
3. The SME must comply with all requirements having the force of law in Tanzania.
4. The SMEs' business must be economically viable.
5. The SME must have the necessary legal capacity, and the person(s) acting on its behalf must have the necessary written authority to apply for and accept the terms and conditions of the facility agreement.
6. The demonstrated loan purpose is for purchase of metal silos with minimum storage capacity of 500MT or purchase of maize milling machines with capacity of milling at least 30 MT per day of eight working hours.

YieldWise provided matching grants to the SMEs that qualified for the loans from TADB, and these grants were

30% of the capital investments required for the equipment with a maximum of US$80,000 for the steel silos and US$ 40,000 for the milling machines.

YieldWise catalyzed investments in SMEs with matching grants to grain trading or processing companies that set up facilities handling at least 10,000 MT of maize per year. It provided matching grants of US$610,000 that were leveraged to create investments of US$9.5 million for 21 SMEs. These new investments in the maize value chain included:

i) Baby food processing machine and 1,000 MT grain storage silo.

ii) Expansion of a new maize flour processing plant in Bagamoyo District.

iii) Construction of factory building and procurement of maize milling machine.

iv) Working capital to finance procurement of grains (maize) from farmers, purchase of machinery and expansion.

These investments led to rapid increase in throughput capacity to 300,000 MT per annum and processing capacity of 1,228 MT per day.

Figure 40: TADB public call for loan applications in 2019

The increased demand for maize will be sustained due to the investment capital injected by YieldWise's development finance partner in Tanzania. In 2019, TADB launched a new product, Special Purpose Agricultural Loan Facility, to finance SMEs for the management of modern post-harvest handling, storage and milling equipment. It combines capital expenditure loans with working capital for improved loan repayment.

Finance for agro-dealers

AGRA established an innovative finance facility with two commercial banks to facilitate agro-dealers' access to working capital to stock post-harvest management technologies with a particular focus on storage technologies such as hermetic cocoons and bags, and metal silos and tarpaulins. The goal of this intervention was to enable distributors and vendors of post-harvest technologies access working capital to stock products for supply to smallholder farmers in Tanzania. The use of these on-farm technologies proved to be cost effective in reducing storage losses. Through this partnership, US$447,144 worth of working capital stock was leveraged.

Table 16: Performance of the revolving fund as of 2020

Bank	Total loans disbursed (TZS)	Total loans disbursed (US$)	Number of agro-dealers
Equity Bank Tanzania	708,018,000	306,501	42
TPB Bank Plc	321,300,000	140,613	22
Total	**1,029,318,000**	**447,114**	**64**

Through business to business meetings, YieldWise has connected 440 (20% female) agro-dealers with partner banks to access financing. Feedback from partner banks and potential agro-dealers showed that SMEs borrow to trade in a wide range of products targeting the entire value chain from production to market., thus, it is important to develop flexible financial products that bundle farm inputs and post-harvest technologies.

Finance for input loans

Under YieldWise, AGRA facilitated farmers to access US$3.1 million in farm input loans between 2017 and 2020. In partnership with FtMA, YieldWise also facilitated forward delivery contract arrangements with the objective of improving farmers' access to reliable agricultural inputs and markets. Agreements were facilitated between off-takers and farmer organizations stipulating that input loans would be provided to farmers on the strength of the contract and would be repaid at the time the crop is purchased by the off-taker.

Farmers deposited 20% of input costs with the financial institution and committed to selling their crop to the contracted off-taker or processor. The agreement was a tripartite arrangement involving farmers, anchor buyers and the bank. The bank paid agro-dealers directly for inputs supplied to farmers after they presented a pro-forma invoice to the bank.

Loan repayment is over 95% and given the profitability of the maize value chain as observed during YieldWise implementation, these financial products will continue.

Technology Distribution and Utilization

Comprehensive economic study to assess the country-wide economic benefits of adopting zero rating of post-harvest technologies for VAT purposes

AGRA commissioned an economic study to assess the impact of removing the 18% VAT charged on hermetic storage technologies. The key finding was that removal of VAT on post-harvest technologies would have a significant impact on the economy and farmers' income. The gains accrued to farmers from using hermetic bags outweigh the costs of the bags and the extra costs associated with the adoption of the bags, which amounts to US$28.05 million (about TZS65.9 billion) per season. The total net benefit to the society for implementing the VAT removal would be US$38.9 million per season. Therefore, the removal of VAT would increase the total net benefit to the society by US$10.9 million per season, equivalent to TZS25.6 billion per season, since the removal of tax would increase demand by 1.5 times. These results have been presented to the Ministry of Finance fiscal committee and three committees of Parliament. This was part of advocacy efforts for the removal of VAT.

Drivers of adoption of hermetic technologies and lean data measurements

In an effort to measure the levels of intake and establish drivers and barriers to further adoption of hermetic storage technologies by smallholder maize farmers in Tanzania, AGRA contracted IPSOS – a market research company – to undertake a lean data measurement study with a panel of farmers in the south and north zones to inform project activities. The overall objective was to identify the current levels of penetration of hermetic storage technologies and seek applicable lessons to drive adoption through commercial pathways in Tanzania. Figure 41 is a summary of the survey findings:

Harvest handling

- Threshing is mainly done using machines (73%).
- Most farmers harvest fully dried maize in field.
- Farmers who dry maize at home mainly use tarpaulins (88%).
- Non-users of tarpaulins attribute this to lack of ownership (36%) and unaffordability (28%).

Storage practices

- Normal gunny bags are still heavily used by farmers to store maize (55%).
- 36% of respondents used Purdue Improved Cowpea Storage (PICS) bags to store maize. SAGCOT (39%) had higher usage of PICs than North (29%).
- Silos and cocoons still have very low usage due to unaffordability.

Post-harvest loss interventions

- Only 40% of farmers had been exposed to PHL reduction interventions, especially from SAGCOT (40%) than North (35%).
- RUDI (14%) was the main organization responsible for farmer exposure to interventions followed by Briten (11%).
- Main intervention received by farmers was training on use of tarpaulins at harvesting and threshing (54%) and collective selling (34%).
- There was high level of satisfaction with organizations that provided PHL interventions, all scored above 85%.
- In terms of likelihood to recommend, AGRA had the highest NPS score 94%.
- The key improvement area needed by farmers is increase in frequency of training on PH management.

Making efforts

- Traders and middlemen key buyers of maize from farmers (71%).
- Only 8% of respondents based in SAGCOT had contracts with agents working with AGRA/WFP.
- Farmers mainly sell maize individually (85%), selling through groups is still not practiced by majority of the farmers. Only 15% admitted to having sold maize through farmer groups in the last harvest season, all of who are based in SAGCOT.
- Of the few farmers who sold maize through farmer groups in the last harvest season, only 4 out of 10 were satisfied with the process.

Figure 41: Findings of study on drivers of adoption of hermetic technologies

The survey helped to fill data gaps and provided the YieldWise initiative with insights on what has worked, what has not worked and lessons on scalable practices.

Distribution of post-harvest technologies at farmer and group level

Under the component aimed at promoting the adoption of appropriate loss-reducing technologies to improve crop handling, storage, and processing among 200,000 smallholder farmers, YieldWise accomplished the following:

a) Two business to business meetings were conducted in Morogoro and Mwanza to enhance financing in post-harvest management.

b) The project supported mobilization of farmer orders for post-harvest loss reduction technologies.

c) Farmers were linked to agro-dealers supplying post-harvest loss reduction technologies.

In total, 411 agro-dealers were supplied with post-harvest loss reduction technologies and 90,444 farmers purchased these technologies. Among these technologies, 155,963 hermetics bags, 18,843 tarpaulins and 766 silos were sold. More orders continue to be received from farmers under the various agribusiness consortia projects. These orders are communicated to agro-dealers in the area and delivered once cash mobilization/collection from ordering farmers has been confirmed by group leaders.

At farmer level, 214 farmer organizations received 234 digital weighing scales, 860 tarpaulins, and 229 moisture meters. Also, 21 buyers/SMEs were supported with aggregation center equipment to promote the adoption and demonstration of post-harvets loss reduction technologies to farmer organizations while buying maize. The SMEs received three weighing scales, 49 tarpaulins and 20 moisture meters. Table 5.2 provides a summary of aggregation centers equipment support.

Prioritization of Loss Prevention and Knowledge Management

The National Post-Harvest Management Strategy (NPHMS)

The Tanzania National Agriculture Policy (2013) acknowledges the high pre- and post-harvest losses among the key challenges in the agriculture sector amounting to 30%-40% for cereals, and higher for perishable crops. These are high magnitude of losses that are attributed to perishability of crops, and poor post-harvest infrastructure and handling practices. Post-harvest loss affects household food security and erodes profits by reducing marketable volumes.

As a response to this situation, YieldWise and other stakeholders provided support to the Government of Tanzania to develop a National Post-Harvest Management Strategy (NPHMS). The NPHMS is a 10-year (2019–2029) cross-sectoral document aimed at providing significant interventions to reduce post-harvest losses and potentially offset the food deficit and achieve national food needs. The NPHMS focuses on food crops, particularly cereals, legumes, fruits and vegetables, roots and tubers as well as edible oil crops.

To achieve the goal, a number of strategic objectives have been set:

a) Facilitate awareness on post-harvest management to improve efficiency and reduce crop losses along the value chain.

b) Promote availability, accessibility, affordability and adoption of tested technologies and processes to reduce post-harvest losses.

c) Facilitate agricultural marketing systems to improve market access

d) Promote research and innovation of new and appropriate technologies and methods to reduce crop losses.

e) Review and put in place new legislation to ensure compliance with standards and adoption of practices to minimize post-harvest losses.

f) Strengthen institutional capacity, coordination, partnerships and participation of post-harvest management actors to enhance implementation of strategic interventions.

g) Adopt post-harvest management systems to mitigate the effects of climate change.

h) Address inadequacy of post-harvest management financing.

i) Develop a standard methodology for collecting data and estimating post-harvest loss in the country.

In addition, it is necessary to halve per capita global food waste at the retail and consumer levels. Among the positive effects of post-harvest losses reduction are: reduction of food shortages; improvement of nutrition security by capturing otherwise lost nutrients and creating accessible and affordable diversified diets; and market food price reduction.

Further, building the capacity of post-harvest actors increases their income, and consequently their food and nutrition security. To make agriculture more productive and sustainable, post-harvest loss reduction will help to: enhance farm-level productivity; safeguard the utilization of production resources; avoid producing food that will be lost; and lower unsustainable deployment of limited land, water, energy, inputs and other resources to produce products that are not consumed.

The inclusion of post-harvest management issues in agriculture research themes is desirable. To enable more inclusive and efficient agriculture and food systems, the strategy envisages the improvement and formalization of market access and ensures the availability of specialized human resources to manage marketing infrastructure in order not to lose the advantages of agricultural intensification. The resilience of livelihoods to disasters will be increased by promoting interventions to reduce climate change effects that affect the effectiveness of post-harvest technologies for harvesting and drying, pest and disease management, and storage. Such interventions include:

a) Well-functioning agricultural innovation systems, and in particular, systems for growing and/or storing crops and varieties that are less susceptible to post-harvest pest attacks.

b) Timely harvesting and adequate and protected drying.

c) Maintenance of storage structures.

d) Cleaning and hygiene.

e) Increasing farmer access to market information and transport options.

f) Usage of early warning seasonal forecasts to project how the climatic conditions might impact food storage or marketing strategies.

The overall coordination of this strategy will be vested in the Ministry of Agriculture, in particular, the Post-harvest Management Section under the Division of National Food Security. In fulfilling its functions, the ministry will rely on partnerships and collaboration with key stakeholders including private sector, civil society organizations, community-based organizations, non-state actors and development partners.

Sustainable maintenance of the current lift on food export bans

The Economic and Social Research Foundation (ESRF) has continued to engage the government through the Agriculture Sector Line Ministries' (ASLM) task force, especially the Directorate of Food Security, to ensure that the agenda on the removal of export bans remains on the table. In particular, ESRF has ensured that the lifting of export bans and other export barriers are incorporated in the government's approved Blueprint Action Plan, which is the document that outlines the government's priority actions for enhancing the business-enabling environment.

An important goal of this project was to develop tools that would provide the government with a reliable and predictable mechanism for monitoring food security and hence mitigate against unwarranted trade bans. To this end, ESRF completed a report on the design of the Tanzania food balance sheet, which is ready for presentation to stakeholders for validation.

The government has consistently ruled out the possibility of banning import and export permits of cereal crops and emphasized encouraging farmers to form groups and to have a unified influence. Through the Ministry of Agriculture, the government has continued releasing permits, especially for maize exports and imports into the country. According to the ministry, the government has no plan whatsoever to stop farmers working with the private sector in the import and export of crops.

Sustainability

Successful post-harvest initiatives create win-win business partnerships for all actors – smallholder farmers (producers), input suppliers, off-takers (buyer/processors), financial institutions, training providers (NGOs) and government institutions – in value chain development. According to Blokland (2018), "Once farmers realize they do not need to wait for external parties to provide development, a tipping point is reached. The moment they take development in their hands by hard work and investments with their own capital, things will change, and the ambitions of the farming families will be achieved".

YieldWise achieved sustainability, on three levels:

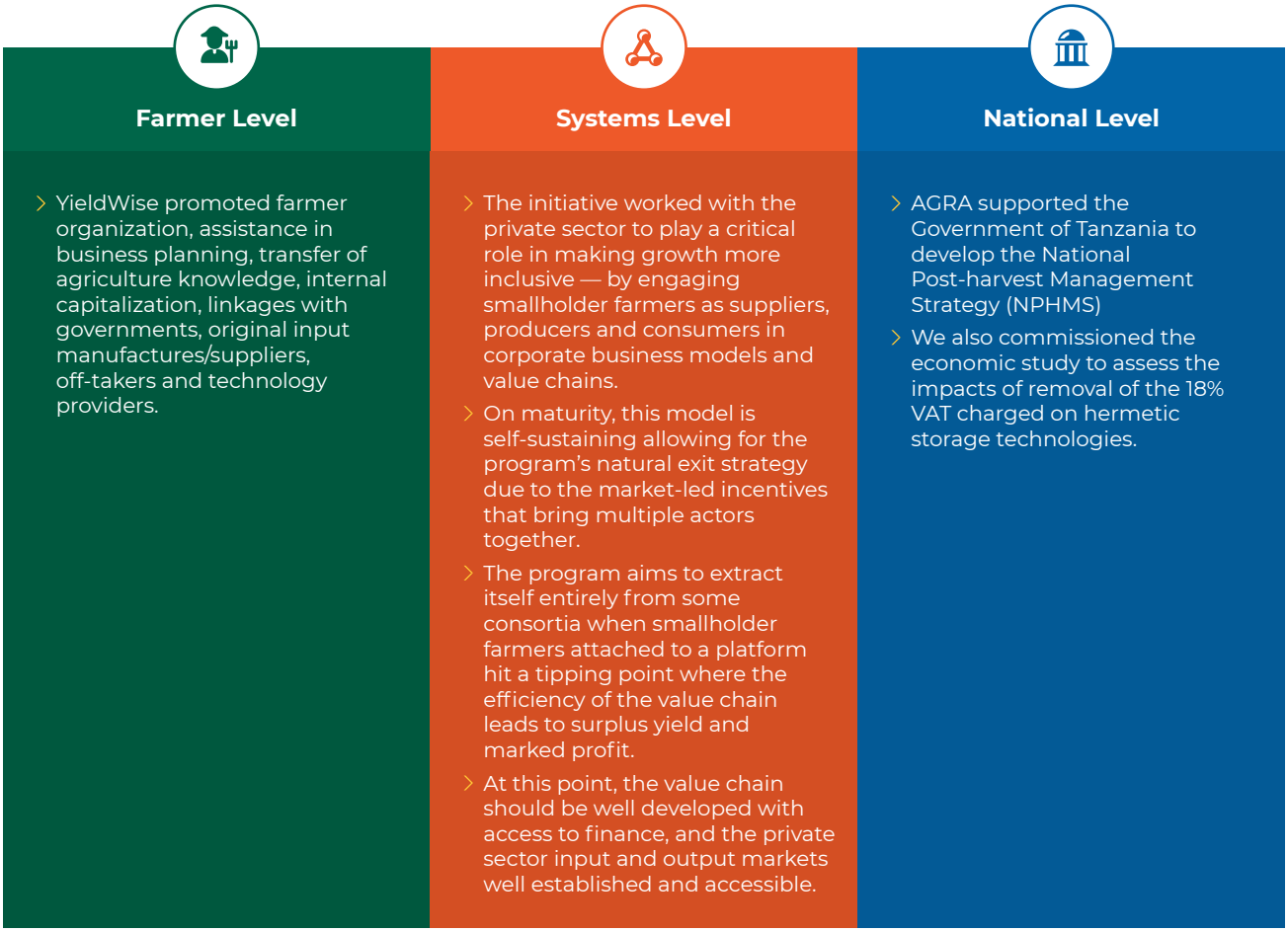


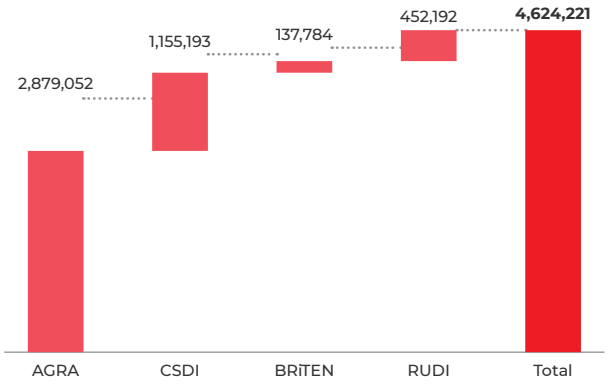
Figure 42: YieldWise Sustainability

Figure 43 summarizes the leveraged investment as a result of the work and outcomes from the YieldWise initiative. By the end of 2020, the value leveraged under the sub-consortium intervention was US$55.7 million, which was 12 times the direct budget that was invested.

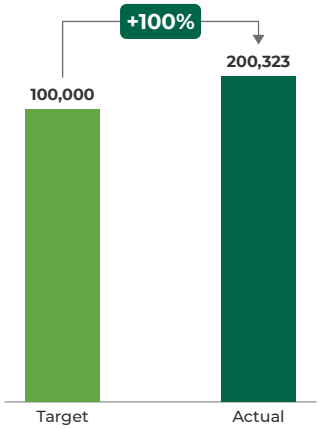
Value leveraged by the YieldWise Thematic Initiative

Implementing Partners and AGRA's Investments in USD

VALUE CHAIN Maize

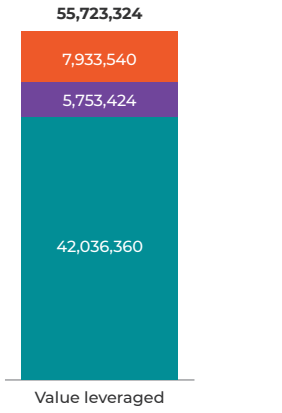


Number of farmers reached



- The value leveraged is **12 times** AGRA's Investments.
- Sustainable **private sector driven** initiative.

Value leveraged in USD



- New private sector investments
- Value of inputs supplied
- Value of crop aggregated and sold

Interventions

- Market demand.
- Farmer aggregation and training.
- Access to finance.
- Adoption of postharvest handling technologies.
- Prioritization of loss prevention and knowledge management.

Farmer-level impact

- **36%** additional food for family consumption (from 220kgs to 300Kgs per season).
- **530%** additional family income from TZS 182,500 (~USD 87) to TZS 1,150,000 (~USD 547).
- **225%** increase in yield (from 0.8MTs of maize per acre to 2.6MTs).
- **360%** increase in maize marketable surplus (from 500Kgs to 2,300Kgs per season).
- **70%** adoption rate for post-harvest technologies.

Business impact

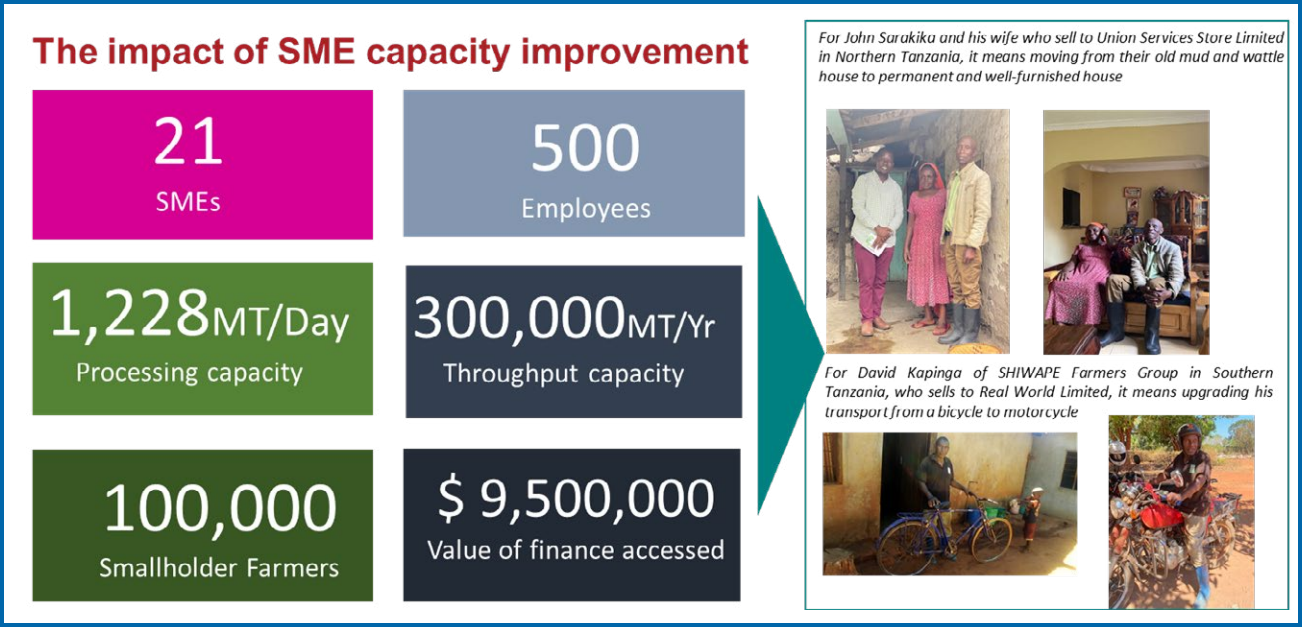
- **38%** increase in sales of farm inputs (sales of USD 1,743,000 to USD 2,400,000).
- **27%** increase in volume sourced and traded by contracted buyers (from 13,110MTs in 2017 to 16,613MTs in 2018).
- **20%** increase in differentiated premium price for better quality and graded maize
- **329%** growth in processing capacity (from 7MTs to 30MTs per day)
- **30%** growth in storage capacity
- **95%** repayment rate for post-harvest equipment loans

Figure 43: Value leveraged by YieldWise

YieldWise delivered sustainable transformation of food market crops through the inclusion of smallholder farmers in formal value chains so that markets are more efficient, resilient and profitable for all stakeholders, with incentivized investment and productivity. The assurance of a market for their produce helped farmers obtain input loans, which they used to buy better seeds, fertilizer and other agricultural inputs, to plant more and sell more after harvest.

Box 12: Yieldwise success stories

Trading and processing SMEs are strategically placed in the middle of agricultural value chains. They have the potential for significant impact at both ends of the value chain by: (a) providing a reliable market for locally sourced crop raw materials, predominantly produced by smallholder farmers, and therefore impacting level and stability of income; (b) providing end consumers with the choice of secondary and tertiary products, which are affordable and of good quality. Trading and agro-processing through SMEs have the potential to create supplier linkages for millions of smallholder farmers, create jobs and help elevate rural incomes across the country.



In 2017, Joydons Tanzania Limited was operating a small milling plant with a capacity of 10 MT per day in a makeshift building, with an operating capital base of US$2,156. In 2019, AGRA, through YieldWise, supported this SME to lay out strategies for expanding business operations through raising adequate capital expenditure and operational expenditure. In 2020, the SME secured financing to the tune of TZS1.3 billion (~US$ 555,560) from TADB to procure a state-of-the-art plant whose features included 90 MT to 120 MT per day maize milling capacity, grain sorting, colour sorting, packing and a weighbridge. The facility also enabled the construction of two foundation bottom silos with 1,000 MTs storage capacity. The company's operating capital base increased from US$2,156 to US$1.3 million. The new plant employs 250 workers both directly and indirectly, and sources grain from over 3,500 smallholder farmers in Tanzania.

Another example is Real World Limited in Songea, Ruvuma Region. Real World is a private company incorporated in Tanzania that deals with food processing (maize flour), animal feeds processing and agribusiness consultancy. With outlets in Dar es Salaam, the company has a wide range of products processed from maize such as maize flour (Sembe and Dona) and animal feeds (pellets and mash for chicken and pigs). In 2018, the company received financing from TADB to expand its capacity. It acquired steel silos with capacity to store 1,000 MT, and a modern milling machine with a capacity of 30 MT per day. As a result, the company's capacity rose from 1,200 MT in 2017 to 7,000 MT per year in 2019. Real World was also linked to 1,500 smallholder farmers who supplied maize each season.

Growth in processing and storage capacity for trading and processing SMEs translates into better market opportunities for smallholder farmers. These SMEs could potentially create market opportunities for over 300,000 farmers if they are supported to grow their markets and start operating at full capacity.

Weaknesses and Opportunities for Improvement

Weaknesses

- The performance of post-harvest financial products was below AGRA's expectations. At the beginning of the program, AGRA expected to stimulate lending to post-harvest management businesses and attract a loan portfolio valued at US$800,000. However, by the end of the third year, partner financial institutions had only disbursed US$447,114 (56%). The low uptake of post-harvest financial products has been attributed to the lack of flexibility to consider various business lines. The target borrowers (agro-dealers and farmers) were dealing in more than post-harvest management technologies. Their business portfolio also included seed,

fertilizer, and crop protection products. AGRA has recommended a restructuring and no cost extension for the revolving funds and matching grants projects.

- Overreliance on few anchor buyers. The program worked with five anchor buyers who entered forward delivery contracts with farmers. However, these anchor buyers were price sensitive and they didn't buy the total contracted volumes.
- Delays in picking up already aggregated grain slowed down further aggregation due to limited warehouse space. In some cases, farmer organizations were not happy because delayed payments resulted in interest being charged on unpaid loans and led to side-selling, which damaged relationships between farmers and off-takers.
- The risk profile of farmer organizations is not uniform. Some were bankable, but others were not ready and had challenges that needed more time and other resources to address. A significant number of them had management and governance challenges due to poor leadership, and some of them did not keep formal records, which disqualified them for input loans.
- In some instances, alliance with input companies that sold directly to farmers without going through local agro-dealers (who carry various product and brands) led to many challenges, including limited choice, lack of after sales service, and exclusion of other suppliers.
- Partial adoption of hermetic technologies. Farmers primarily used post-harvest handling technologies such as hermetic bags for their own food storage and safety. Unfortunately, they admitted applying pesticides to the maize they sell to the market.

Opportunities for improvement

- There is an opportunity to support processors and off-takers to build their end markets, which incentivize investments in smallholder-sourcing initiatives. Future thematic and agribusiness programs should work with SMEs to build forward market linkages, expand end market opportunities and translate these into backward linkages with smallholder farmers.
- The assumption that farmer organizations were ready for finance even without prior training was challenged as most of them were not ready for commercial engagement with banks. There's an opportunity to develop a business development service program to build the capacity of the farmer organizations to engage with financial institutions and increase liquidity in agricultural value chains.
- Food safety is a public health issue and it is critical that governments and respective institutions are supported to start tracking the maximum residue limit in local food markets. Farmers should also be trained on appropriate application of insecticides and the dangers of excessive use.

Conclusion

Empowering smallholder farmers through commercial opportunities requires an understanding of the drivers of farmers' marketing choices: the available marketing options, the characteristics of each channel, and the tradeoffs inherent in the selection of a marketing strategy. Unless farmer organizations have access to credit to offer members partial or full payment upon delivery, this will continue to leave the majority of smallholder farmers unable to participate in structured group marketing and experience prolonged waiting periods for payment. Trading relationships with farmers should be cash based (on delivery) and if payments are to be made later, the price difference should be equal to or higher than the average prevailing interest rate in the economy. Farmer friendly warehouse receipt systems can help solve the cash flow challenges facing aggregators and farmers after harvest.

Future investments in staple food value chains should focus on creating more opportunities for off-takers to invest in standard and large-scale crop aggregation managed as real businesses. Grain handling, processing and end markets should be the starting points of a staple food value chain intervention. Focusing on these three components, stakeholders can deliver significant impact at both ends of the value chain by: (a) providing a reliable market for locally sourced crop raw materials, predominantly produced by smallholder farmers and therefore impacting the

level and stability of income; and (b) providing end market consumers with the choice of locally produced foods that are affordable and of good quality.

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8. Thematic Programs in Support of Agribusiness Consortia: Financial Inclusion

Agaba E., Siewertsen H., Karuho O., Rweyendela V.

Key Messages

- Rural financial services work best when they coordinate or bundle interrelated products and services that address farmers' highest priorities.
- Investment in mechanization models for smallholder farmers need to include investments across the entire ecosystem of mechanization provision including vendors, financiers, mechanic workshops, owners and operators of equipment and farmers.
- Digitization of rural financial institutions is a very effective way to improve last mile financial services delivery channels such as community banks, savings and credit cooperatives (SACCOS) and SMEs – more transparency, faster decision-making, less risk if mobile money is used, less transaction cost for institutions and farmers alike.
- Integrated digital platforms do not work effectively in solving farmers' problems in accessing inputs and markets if the last mile infrastructure does not exist.
- Digital technology offers an efficient mechanism to facilitate transactions between different market actors required to enhance smallholder income and boost rural economies.

Key words

financial inclusion, input finance, mechanization, equipment lease finance, innovative finance, e-verification of inputs, crop insurance, financial literacy

Introduction

According to the National Agriculture Policy of Tanzania 2013, agricultural financing is an important element in the modernization and development of the sector. However, public and private sector agricultural financing in Tanzania is inadequate. Worldwide, agriculture is generally considered a "risky business" – and is not a key priority for potential or prospective creditors or investors. According to the Tanzania 2019 State of the Economy Report, TZS1.8 trillion (~US$776.4 million) was invested in the agriculture sector, representing 9.2% of all disbursed loans by commercial banks.

Rural smallholder families in sub-Saharan Africa remain the most financially excluded households in the world (Mastercard Foundation, 2015). Value chain actors, especially those located upstream, have limited access to financial services, constraining their ability to make productivity-enhancing investments, use technology and services, and reduce risks.

While there are clear opportunities in Tanzania to financially include smallholder farmers through transactional capability, savings mechanisms and credit opportunities, this has been hindered by various obstacles that require a shared approach to unlock. These bottlenecks exist in the following broad categories:

a) Financial products offered by banks are not well structured to address the needs of smallholder farmers. This is true for all usage – transactional, savings and credit needs.

b) The delivery mechanism currently used by banks are their own branch networks, agency banking and technology, thus limiting outreach. This calls for the involvement of other players that have developed trust with the smallholder farmers based on their day-to-day transactions.

c) There is a knowledge gap among the agricultural value chain actors on the available financial solutions that could help them in transacting with smallholder farmers. Financial service providers such as banks have tried to develop and market digital products and mobile accounts, which ended up with farmers opening accounts during crop marketing season for receiving payments and being set aside when the season is over.

According to the 2020 report by GSMA, an association of mobile network operators worldwide, 477 million people in sub-Saharan Africa were subscribed to mobile services, accounting for 45% of the population. The mobile market in the region is expected to reach several important milestones over the next five years: half a billion mobile subscribers in 2021, 1 billion mobile connections in 2024, and 50% subscriber penetration by 2025.

Mobile money has enabled financial services to reach millions of previously unbanked and underbanked people around the world, making the industry a key enabler of financial inclusion. In sub-Saharan Africa, 17 countries have more registered mobile money accounts than bank accounts.

According to the Bank of Tanzania Annual Report for 2019/20, the country had 27.2 million active mobile money accounts as of June 2020. The same report showed that mobile money transactions recorded an annual growth of 21.8% in volume and 8.9% in value from 2018/19.

The emerging digital highways in the target countries allowed financial services to reach farmers at a much lower cost and with reduced risks. The Financial Inclusion for Smallholder Farmers in Africa Project (FISFAP) supported the development, piloting and roll-out of these (digital) products and services as long as they presented a business case for all partners involved and an end-to-end solution for smallholder farmers.

From 2015 to 2020, AGRA, in partnership with Mastercard Foundation, implemented FISFAP to reduce food insecurity and increase the incomes of about 700,000 smallholder farmers in Kenya, Tanzania and Ghana. The target for Tanzania was 441,600 smallholder farmers. This goal was to be achieved through enhancing access to appropriate, affordable and innovative solutions delivered by financial institutions, mobile network operators, digital technology companies and agricultural value chain actors.

FISFAP sought to enable partnerships between financial service providers, value chain actors such as agro-dealers and aggregators, as well as mobile network operators to develop appropriate and affordable (digital) products and services for smallholders.

Inclusive Finance approach

AGRA knows that timely access to a wide range of affordable financial services like payments, savings, insurance, and loan products is crucial for SMEs, farmer-based organizations and farming households to enable them to invest in appropriate technologies, manage cash flows, adapt to climate shocks, and facilitate growth.

AGRA's approach was to build an inclusive agricultural finance system based on partnerships and opportunities that cater for the financial and capacity needs of governments, financial institutions, SMEs and farmers. The strategy drew from an agricultural finance system composed of three critical integrated components that can make the system grow and develop in an inclusive manner.

The first component of this intervention addressed the supply of capital at the right cost and risk profile deployable in agriculture. National governments and development finance institutions (DFIs) have the capacity and resources to de-risk financial institutions by offering them capital that can be blended with private sector resources to reduce

the cost and risk of lending. AGRA supported government, donors and DFIs to design and deploy such blended finance instruments for agriculture that mostly seek to reduce the credit risk, the cost of lending and to provide capacity building for lenders and borrowers.

The second component addressed the providers of financial services and how they can finance the agricultural sector. These providers often find financing the agricultural sector risky and costly. AGRA developed models that reduced the costs and risks of lending through risk sharing among value chain actors, wholesale lending to rural financial institutions or through the use of digital solutions. AGRA supported financial service providers in the development of these models and facilitated the linkages between blended finance facilities and potential borrowers.

The third component supported the users of financial services: agricultural SMEs, rural financial institutions and the smallholder farmers. The bankability of these entities is often limited by their management and governance capabilities, lack of quality data and limited accessibility. AGRA supported providers of innovative solutions to reduce the cost of reaching these actors with financial and non-financial services. Most solutions used digital channels and mobile money to achieve scale at reduced cost.

In Tanzania, AGRA has made various investments aimed at improving the productivity and incomes of smallholder farmers through the provision of innovative solutions that facilitate access to financial and non-financial services for smallholder farmers and agri-SMEs. The FISFAP portfolio, for example, was spread across different geographies within Tanzania covered by the agribusiness consortia.

Partners and innovative solutions implemented

Microfinance institutions (MFIs) products for smallholder farmers

Although mobile money has driven the strong uptake of formal financial services in Tanzania, the use of digital financial services has been slower in realizing its potential in rural areas. However, digital technology has radically changed the playing field for financial inclusion in Tanzania, and COVID-19 restrictions have stimulated even more innovation and widespread adoption of digital financial services.

Rural digital financial services work best when they coordinate or bundle interrelated products and services that address farmers' highest priorities. Four critical ingredients for farmers' livelihoods need to be united: relevant financial services, reliable market access, high-priority inputs and skills in agricultural practices, financial management and digital literacy. The absence of any one of these factors reduces the value proposition of the others. Service providers can deliver these through a combination of technology and in-person engagement, thus, digital platforms present an opportunity to efficiently coordinate the offerings of multiple actors.

The solution

AGRA invested US $568,000 in a partnership with SELF Microfinance Fund (SELF) to develop and deploy an innovative financial product known as income smoothening, which was piloted through three community financial institutions: Mufindi Community Bank in Iringa, Mahanje SACCOs in Ruvuma and Ecumenical Loan Fund (ECLOF) in northern Tanzania. The goal was to develop a scalable product that SELF would be able to roll out to its other partner financial institutions as illustrated in Figure 44.

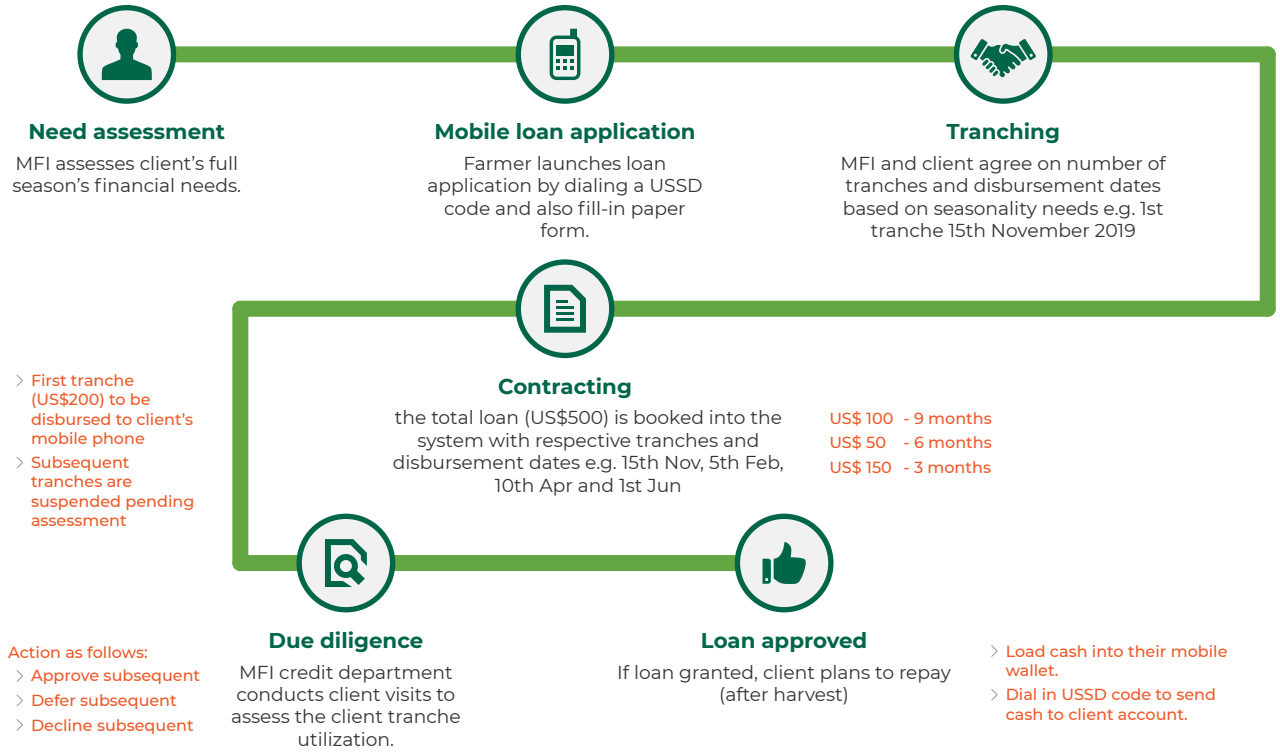


Figure 44: Income smoothening product design

Benefits for both demand and supply side of credit

Demand side: Disbursement in tranches is an important feature of income smoothening financial products. It prevents farmers from panic-selling their crop harvest to repay loans or borrow from expensive moneylenders during the cropping season. It also helps farmers to manage their cash better and avoid diversion of funds into unplanned expenses. The income smoothening product enables smallholder farmers to meet their needs and sell their produce when prices have stabilized so that they can repay loans and save.

Supply side: SELF as a wholesale lender to retail MFIs reduced its transaction costs by 3% by adopting digital assessment and disbursement in tranches. It also benefitted the borrowers (retail MFIs) with a 2% cost reduction. Furthermore, the interest rate charged by SELF was reduced from 11% to 9% per annum as a result of tranche disbursement.

The investments in digital platform allowed SELF to:

- Review partner credit applications digitally within the shortest period hence reduced turnaround time from five days to two days.
- Access to real time transactions at the partner MFI after disbursement (backend visibility). This reduced risk of diverting the loan to unintended use by the MFIs.
- Track the credit performance of the end customers.

Tranche disbursement enabled SELF to have adequate liquidity as the loans were released matching the seasonal demands of the end customers. The resulting improved cashflow management ensured partners had sufficient liquidity to meet customer cash needs.

Results

By the end of the intervention in 2019; this partnership had achieved the following:

- 15,832 (46% female) out of 15,000 smallholder farmers initially targeted were trained on financial literacy,

including how alternative financing works, warehouse receipt systems, how to avoid risk defaults, and use of digital tools to access and service loans.

- For the first time, farmers had access to "income smoothening loans" due to these innovative loan products: 6,836 farmers had access to loans worth US$2,061,086 out of a target of US$1,500,000.
- At the financial system level, two financial products were developed. These products were i) income smoothening loan product (Warehouse Receipt Loan) that caters for seasonal needs of a farmer, including money to smoothen the farmers' family consumption in months before and after harvest; ii) Mkulima Digital Loan Product that provides farmers with working capital to support agricultural production, disbursed in tranches across the cropping season.
- Based on the successes of the tranche disbursement of agricultural loans, partner MFIs are also using this model to cover non-agriculture loan products, such as housing loans. Smallholder farmers are using the same digital application to deposit savings and pay loans.

NMB Foundation for Agricultural Development

Tanzania has recorded a significant growth in the levels of financial inclusion in the last decade. The level of usage of informal financial services narrowed from 29% to 7%, while the percentage of the adult population using formal financial services quadrupled from 16% in 2009 to 65.3% in 2017. The opportunity for digital financial services for smallholder farmers is promising in Tanzania, given the significant advances in financial inclusion, largely attributable to the growth of mobile money.

According to FinScope (2017), 65% of dedicated farmers in Tanzania that have taken-up mobile money use their accounts less than once a month. Although lack of use is a complex issue, there is evidence that it is also a key barrier. Well-adapted financial products with better use cases can create a win-win scenario where both the private sector and dedicated farmers benefit.

The solution

AGRA invested US$302,305 in a partnership with NMB Foundation for Agricultural Development to support the enhanced use of digital banking mobile accounts like *Chap Chap* and other products for smallholder farmers in the maize, rice and beans value chains in Iringa, Sumbawanga, Katavi, Dodoma and Mtwara. Three of these regions (Iringa, Sumbawanga, Katavi) overlapped with AGRA agribusiness consortia. Figure 41 shows the operational model of this partnership.

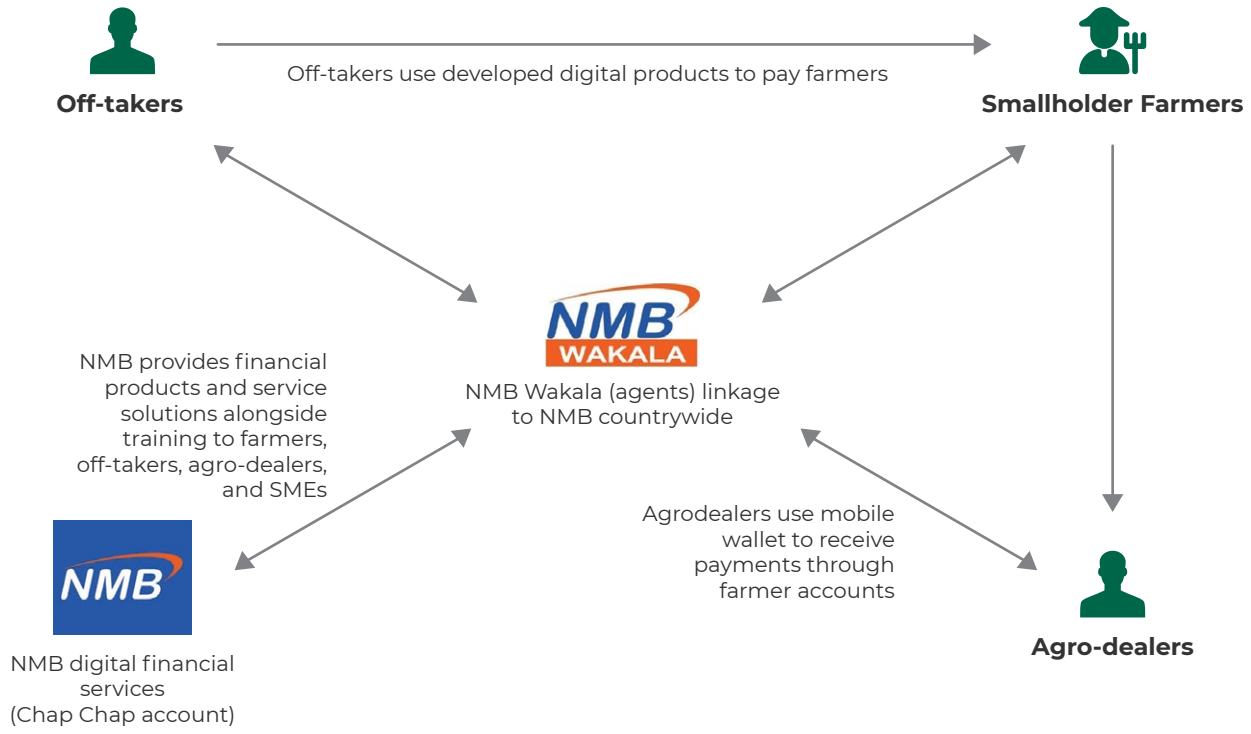


Figure 45: Operational model of NMB-AGRA partnership

In this model, NMB links a network of SMEs (NMB agents, off-takers, agro-dealers) to farmers by leveraging digital financial technology. NMB Foundation for Agricultural Development unit plays an important role in capacity building for SMEs, cooperatives and farmer groups while NMB Bank does the financing.

Results

New distribution models (through SMEs), marketing material (posters and promotional spots) and training materials were developed and are currently in use by both the bank and the foundation. During the investment period, 45,822 farmers were trained on the financial services offered through the digital banking solution. Of these 3,431 were reported to be using digital financial services. A total of 467 SMEs were trained on the digital financial solutions. Of these, 187 off-takers paid smallholder farmers through digital payments.

Empowering smallholder farmers through mechanization services

Introduction

Shifting from human labor-powered crop cultivation and management to mechanized operations is key to increased productivity and transformation in the agriculture sector. Mechanization holds tremendous potential for increasing farm yields, opening new market opportunities for smallholder farmers, attracting youth to the sector, and boosting agricultural production.

Mechanization covers all levels of farming and processing technologies, from simple and basic hand tools to more sophisticated and motorized equipment (FAO & AUC, 2018). Like most of sub-Saharan Africa, many smallholder farmers in Tanzania still operate using manual or animal labor. This is in part because they have limited financial resources to purchase equipment such as a tractor or thresher. On the other hand, the few equipment owners who could earn extra income by providing mechanization services confront the hurdles of finding and aggregating customers for profitable delivery of services.

In view of this, AGRA worked with partners to pilot two mechanization models to increase access to services at the production and post-harvest levels.

Access to farm mechanization services model

AGRA invested US$766,330 in a partnership with ETC Agro Tractors & Implements Ltd to develop a model for mechanization hire services to enhance access by smallholder farmers. ETC Agro, a subsidiary of Export Trading Group, is a farm equipment company that sells and services tractors and other farm implements in Tanzania.

When ETC Agro began collaborating with AGRA in early 2017, they were seeking to develop an equipment finance model that would enable more farmers, including smallholders, to buy tractors, thereby increasing tractor sales, farm mechanization and production in Tanzania.

Figure 46: ETC Agro financing model

As a tractor dealer within a larger agricultural value chain company, ETC Agro realized that sales were constrained by the company's 50% downpayment requirement. To overcome this, the company created partnerships with a number of banks to spread the risk. ETC Agro offered a 50% buy-back guarantee to attract its first two bank partners. Once proof of concept was established, the company signed on additional financial service providers without the buy-back guarantee. With this arrangement, equipment loan downpayments were reduced first to 35% and eventually to 20%-25% with the banks taking on the additional risk. ETC Agro also provided coaching and support to buyers in collecting documentation and applying for the loans. According to the firm, it now receives regular requests from financial service providers, and of the 140 tractors financed so far, it has only had to "buy back" three tractors (a 2% default rate). This mechanization partnership helped to prove a solid business case for mechanization service provision.

Lead farmers were required to deposit 25% of the cost of the equipment and ETC Agro provided a 50% guarantee to buy back the tractor in case of default. This opened a new avenue for financial institutions to venture out into agricultural lease financing and still have minimal risk, as ETC Agro would buy back the tractor at a pre-decided depreciation formula in case the lead farmer fails to repay the loan at the end of the repayment period.

The initiative covered the regions of Iringa, Mbeya, Ruvuma, Manyara, Kagera and Dodoma. Some of these regions were also the same covered by the agribusiness consortia interventions.

Results

This partnership increased the supply of tractor services to thousands of smallholder farmers through the provision of rental services. Table 17 summarizes the outcomes.

Table 17: Summary outcomes of the mechanization initiative under the inclusive finance intervention

Indicator	Outcome
Number of farmers accessing tractor hiring services	21,453
Number of lead farmers/agri-SMEs offering hiring	174

Indicator	Outcome
Number of tractors financed	140
Number of local garages upgraded, trained and offering maintenance	22
Hectares ploughed	52,156

Note. These 21,453 farmers accessed tractor mechanization services from the newly purchased 140 tractors under this project.

A critical ingredient of the model is digital access to mechanization services and a tracking device with GPRS capability that allows tractor owners to monitor the location and activity of their equipment. In early 2021, ETC Agro launched a rent a tractor application to expand the reach of the equipment to more smallholder farmers and to maximize the number of farms served. Through the application, farmers or their agents can check availability of tractors in their locality and place orders for tractor services. Farmers receive a confirmation SMS and can pay from their mobile phones.

ETC Agro hopes that the booking agents will earn enough in commissions to incentivize their ongoing engagement and make the service sustainable, but so far, the company still covers the agents' daily transportation for conducting outreach and ongoing support. ETC Agro has overcome network connection hurdles to get their own GPRS-based tracking up-and-running (for instance, incorporating two SIM cards to accommodate spotty network coverage in the areas they serve), as a way of incentivizing owners to use tractors for service provision. The company is finding that such technology makes service provision more transparent, less risky and more viable as a business activity, for owners as well as operators.

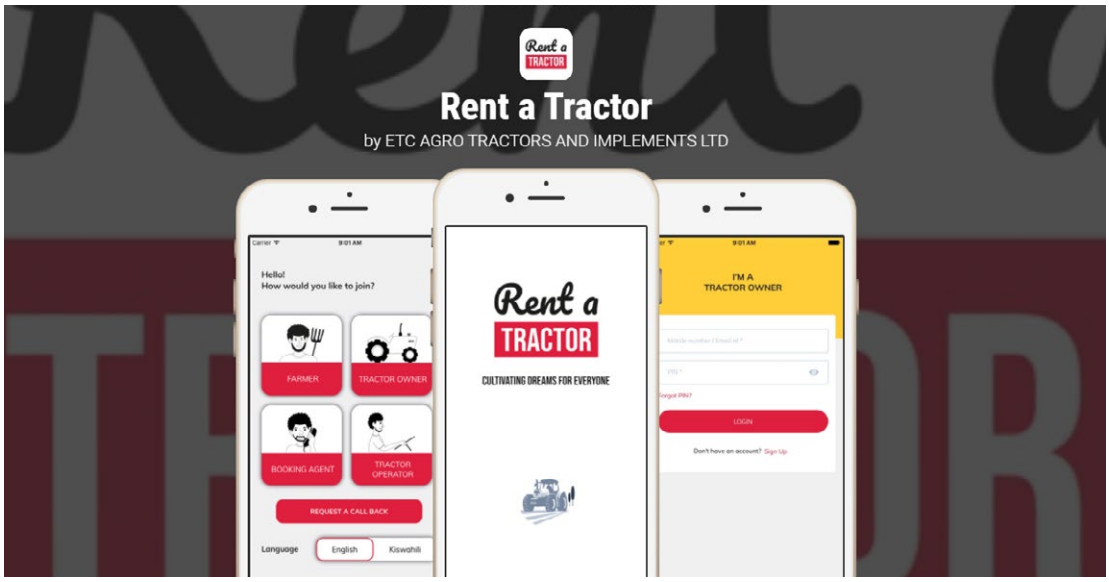


Figure 47: How the rent a tractor application works

Post-harvest mechanization services

When COVID-19 cases in Tanzania began to rise by the end of March 2020, the government imposed localized recommendations that restricted public gatherings and community events, closed educational institutions and encouraged citizens to stay at home except for essential purposes. Although these restrictions were eased in May 2020, ensuing uncertainties continued to affect harvesting operations that are dependent on seasonal migrant labour.

This situation exacerbated food insecurity in Tanzania due to:

1. shortage of agricultural labor (for harvesting and processing), making mechanization the most appropriate way of continuing agricultural activities with minimal human contact.

2. increased post-harvest losses as crops remained in the field several weeks beyond the maturity period.
3. limited options to reach markets for the farmers who were harvesting their produce, hence the need for them to process and store their produce in safe, clean, and nearby locations.

Mechanizing agricultural operations leads to higher farm and labor productivity and prevents post-harvest losses. Studies show that farmers experience most post-harvest losses during threshing and de-husking.

Table 18: Analysis of post-harvest losses at different stages in SAGCOT corridor

Post-harvest operations	Beneficiary			Control		
	Baseline	Mid-line	End-line	Baseline	Mid-line	End-line
Loss at harvesting (de-husking)	8%	6%	4%	7%	3%	12%
Loss at threshing/winnowing)	9%	8%	3%	13%	18%	8%
Loss at drying	3%	2%	2%	3%	3%	7%
Loss at storage	2%	2%	2%	7%	2%	4%

Note: AGRA. (2020).

Figure 48: Modern artisanal maize threshing machine

The traditional way of maize threshing by hand and beating the cob by stick increases losses and involves a lot of human labor.

In 2020, AGRA invested US$379,500 in partnership with TAPBDS to accelerate uptake and use of improved and proven technologies for harvesting, threshing, processing, storing and transporting produce from fields to markets. This was implemented in Kigoma, Kagera, Iringa, Njombe, Ruvuma, Rukwa and Katavi regions where AGRA already invested in agribusiness consortia with a critical mass of smallholder farmers.

Model to accelerate uptake of post-harvest loss reduction technologies

This partnership used a systems lens to (i) strengthen the response to COVID-19, (ii) accelerate recovery from shocks and stresses, and (iii) strengthen the resilience of the mechanization service market system.

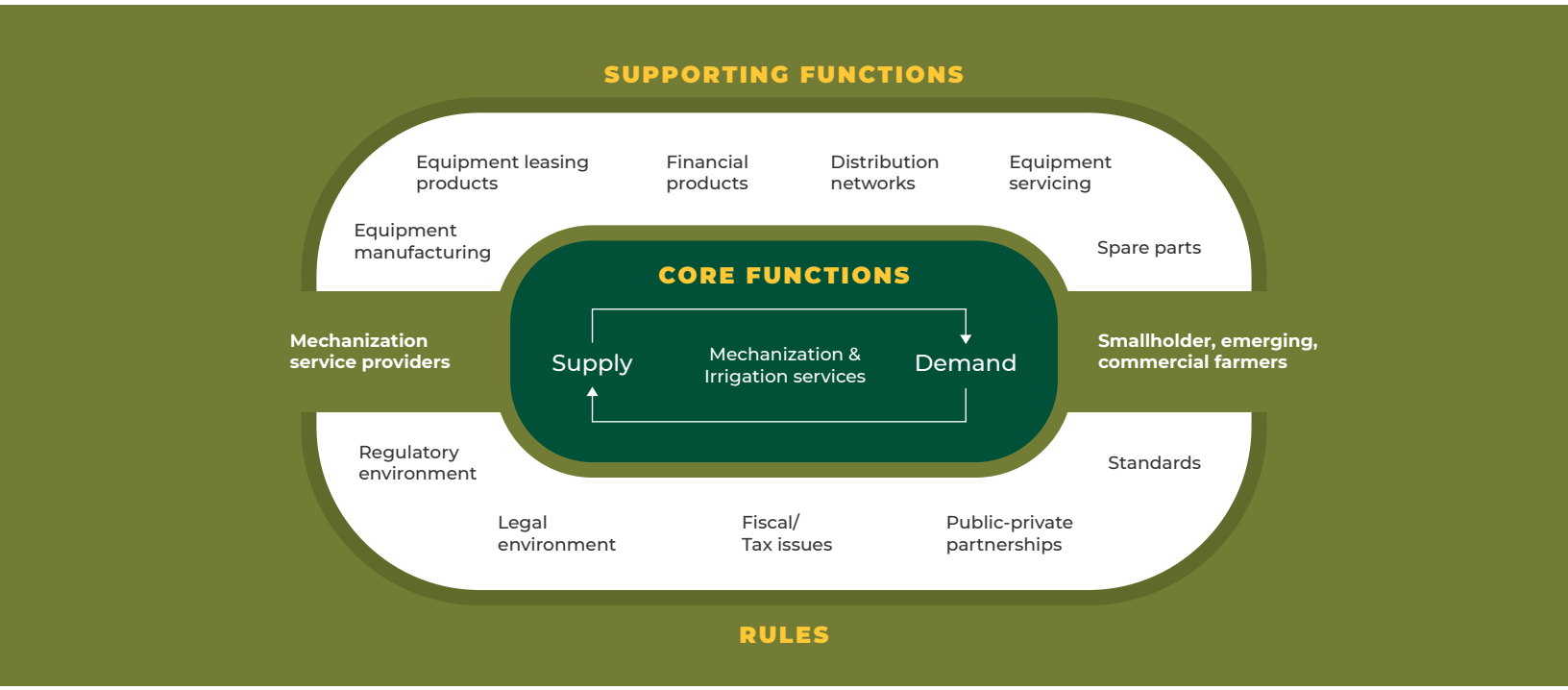


Figure 49: Model to accelarate adoption of post-harvest loss reduction technologies

Through financing arrangements with banks and matching grants, crop threshing machines were acquired by entrepreneurs and SMEs within or near the localities where smallholder farmers live. This was to ensure that threshing services were available within smallholder farming communities. On the demand side, farmers were mobilized from the agribusiness consortia where they had already been trained about effective post-harvest management. These farmers then accessed threshing services at a small fee without carrying the financial burden of purchasing the equipment. The partnership also worked with post-harvest management technology manufacturers to drive uptake through their distribution systems.

The partners in this model included:

- SMEs providing threshing services, processing, storing and transporting smallholder farmers' produce
- Suppliers of post-harvest management technologies, especially threshing machines.
- Local manufacturers or artisans that were fabricating low-cost threshing machines.
- Financial institutions that were willing to lend to suppliers and manufacturers of threshing machines.

Results

Below are the outcomes of this partnership.

Table 19: Outcomes of partnership to accelerate uptake of post-harvest loss reduction technologies

Indicator	Achieved
30 SMEs (including 11 women-owned) identified, trained in threshing business management, and their contribution of US$96,000 mobilized	31 (40% female-owned) were identified and trained on threshing business. They mobilized financing valued at US$ 116,855 to acquire threshing machines.

Indicator	Achieved
Threshing machines suppliers (with after-sale services) identified, and partnership agreements signed	TAPBDS worked with 3 threshing machine suppliers (Imara Tech, Poly Machinery and Intermech Engineering)
30 threshing machines acquired; 60% cost covered by AGRA and 40% covered by service provider (SMEs)	64 threshing machines acquired (Imara Tech 55, Poly Machinery 8, and Intermech Engineering 1)
5 local manufacturers/artisans (especially those trained by SIL) supported to start the mass production of threshers	5 local manufacturers/artisans identified, trained and supported to start mass production of threshers
First loss guarantee: 2 financial institutions mobilized to develop financial products suitable for the threshing businesses and associated post-harvest services	Three financial institutions (TPB, NMB & Amana Bank) mobilized and notified of the threshing business to develop suitable financial products. Signed loss guarantee with NMB Bank and TPB Bank
Digitized service order processes: 100,000 farmers mobilized and linked to threshing service providers through the establishment of threshing hubs	70,600 farmers were mobilized within the catchment areas of SMEs that acquired threshers. A digital order platform was developed and made accessible to farmers through USSD[12] code
Recruitment and training of young men and women to operate threshing machines to be conducted after acquisition is complete	A total of 122 operators (96 male and 26 female) were recruited, trained, and entered working agreements with the SMEs.

E-verification system for agricultural inputs

Over two-thirds of Tanzania's labor force works in agriculture, making it the mainstay of the Tanzanian economy, with small-scale farmers dominating food production. Owing to the high demand for seeds and pesticides, some unscrupulous traders have taken to illegally repackaging or producing and supplying counterfeit seeds and pesticides. These sub-standard inputs are sold to unsuspecting farmers, who believe they have purchased genuine high-quality products only to be disappointed when they end up with poor crop yields. In 2014, it was reported that approximately 40% of agricultural inputs (seeds, fertilizers and pesticides) bought in Tanzania were likely to be counterfeit. Despite several efforts, farmers still encounter counterfeit inputs in the market, particularly fertilizers, seeds and agro-chemicals (ACT, 2016). Crop seeds are the most counterfeited agro-inputs, along with animal feeds. Using counterfeit inputs causes poor crop yields, which adversely impact farmers' incomes and their livelihoods.

The solution

AGRA invested US$530,200 in a digital electronic platform to provide farmers with reliable and affordable high quality farm inputs they can trust. The platform called T-Hakiki (formerly e-Hakiki) uses technology to provide accessible, scalable solutions for smallholder farmers whilst bundling verification with the inputs farmers already use like seed and fertilizer. The implementing partner for this solution was Quincewood, a Tanzania mobile services

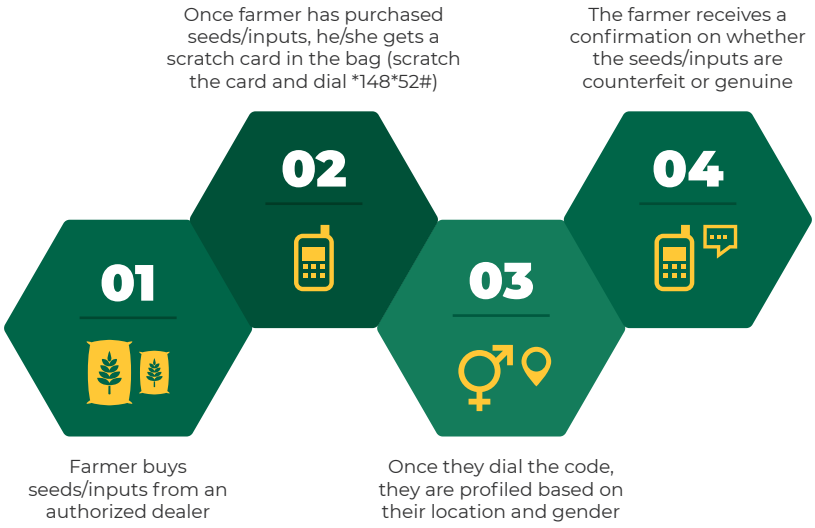
12 Unstructured Supplementary Service Data (USSD) is a protocol for cellphones to communicate with their service provider's computers via text. It is normally used to check mobile airtime and data balance enquiries, or to receive one-time passwords or PIN codes. Despite the multitude of smartphone apps and online communication programs now available, USSD remains one of the few truly inclusive mobile technologies, which is a key factor when dealing with farmers in an emerging market like Tanzania. Unlike SMS, USSD operates in real time, meaning it allows for two-way communication as long as the communication line stays open, making the verification process virtually instantaneous. USSD works on all cellphones, whether basic or smart, and is free for farmers to use on all cellular networks. No Internet connection or data bundles are required. Furthermore, USSD is not mobile software or SIM-based, which means that it can run without either; it just needs a connection to the GSM network.

company.

T-Hakiki engages private sector input providers, farmers and TOSCI in its offering. At agro-dealer shops, via their mobile phones, farmers can verify the authenticity of seeds or pesticides that have T-Hakiki verification stickers on them.

Each packet of seed has a verification label with a unique code. Farmers text this verification number to a special USSD code to determine if the seed packet has been certified by TOSCI and is suitable for purchase. The same procedure is applied to pesticides, which are subject to verification by TPRI.

The developer consulted closely with stakeholders, consumers and TOSCI to test and implement T-Hakiki. This partnership led to further collaboration with other agricultural government agencies like TPRI. The platform is fully endorsed by the Ministry of Agriculture.



How T-Hakiki works

STEP 01
Each bag has a verification label attached or QR code printed on the bag.

STEP 02
At the shop, an agent/inspector using the T-Hakiki app can verify seeds/inputs.

STEP 03
During the season, the farmer receives farming tips and referral incentives.

STEP 04
At the start of the season, T-Hakiki allows seed companies to track distribution, likewise inspector to track certified seeds/inputs.

Source: Quincewood

Figure 50: How T-Hakiki works

Results

Over 350,000 farmers in Tanzania now use T-Hakiki to verify their input purchases. As of 2020, over 4,700,000 seed packages had been encrypted with identification numbers. TOSCI and TPRI now utilize the digital labels for verification of seeds and pesticides, while 40 seed companies and 101 pesticide companies have been trained and registered to use the system.

This investment worth over TZS3 billion (~US$1.3 million) will help over 10 million farmers avoid fake inputs and increase the use of genuine inputs.

T-Hakiki has been adopted by government and is available on the platforms of major telecommunication companies in Tanzania.

Box 13: Testimonials on seed verification

"I have been buying seeds from different companies until last year when I decided to purchase from CHUTCU, (Chunya Tobacco Co-operative Union) after they brought us seeds from Meru Agro. Those seeds had eHakiki (now T-Hakiki) vouchers and we had been informed how to use the voucher. This service has greatly helped us because we now have an assurance that we won't be deceived to buy fake seeds." Vitus Zunda, Matwiga AMCOS, Chunya.

"After getting the voucher, I was able to call and verify the seed. I was also given more information about how to plant the seed as well as how to use fertilizer and crop management. This farming knowledge has increased my production." Simon Mayagile, a farmer in Msisi village, Mbarali District, Mbeya.

"I am thankful that I saved the scratch card. I called the T-Hakiki team as my farm had army-worms but with their guidance, I was able to buy pesticides in good time to salvage my farm." Wema Kapilile, a farmer in Itengulinyi village, Lumuli District, Iringa.

"This is certainly the best revolution that will save not only the farmer, but also assist the Government to deal with unscrupulous traders. T-Hakiki will revolutionize the agriculture sector and improve food security, thus increasing the income of smallholder farmers and reducing the prevalence of counterfeit/adulterated agricultural inputs in Tanzania." TOSCI Director General Patrick Ngwediagi during the T-Hakiki launch on August 8.

Insurance

Smallholder farmers are often exposed to shocks and stresses caused by pests and diseases, unreliable rainfall patterns and in some cases, counterfeit farm inputs. As a result, farmers become hesitant to increase their farm investment. This leads to smallholder farmers not investing optimally, leaving them in a vicious cycle of poverty.

According to the Ministry of Finance and Planning, the government recognizes agriculture insurance as an agricultural financing tool. In the Finance Act of 2020/2021, the government removed VAT on crop agricultural insurance with the aim of promoting agriculture, and to encourage farmers to insure their crop. However, the private sector appetite for developing agriculture insurance products is still exceptionally low. This is because some public investments need to happen first.

A well-designed insurance product could contribute to shock management and enhance smallholder farmers' resilience using insurance pay-outs as a livelihoods buffer in poor seasons and capitalizing on good seasons to afford insurance premiums.

The solution

AGRA invested US$238,465 in an initiative aimed at improving smallholder farmers' resilience through crop insurance under a project called *Wekeza Kwa Uhakika* (invest with certainty). This was in partnership with TAPBDS and private sector insurance partners – National Insurance Corporation (NIC), Reliance Insurance Company, ACRE Africa and Quincewood Group. The initiative piloted a micro-insurance product named *Lima Salama* (farm peacefully).

Lima Salama is a hybrid crop insurance product, which is a combination of weather index insurance (WII) and multi-peril crop insurance (MPCI) for maize and paddy. The product is priced at a 10% premium rate and distributed in voucher scratch cards. Distribution of the cover is through aggregators, agro-dealers, farmer organizations and extension officers. Sensitization campaigns for smallholder farmers are planned around the aggregators who have agreed to sign up as selling outlets, as well as bundling Lima Salama with other forms of inputs.

This insurance product was piloted in the six districts of Mvomero and Kilombero in Morogoro Region, Njombe DC & Ludewa DC in Njombe Region and Songea DC & Madaba in Ruvuma Region.

Results

This insurance product was approved by Tanzania Insurance Regulatory Authority (TIRA) as a hybrid crop insurance product. By the end of the partnership in early 2021, 20,483 (40% female) smallholder farmers had been trained in crop insurance, and 125 aggregators and 225 lead farmers had been trained in both crop insurance and premium collection to act as distribution agents across seven regions. Two MoUs have been signed with local governments to encourage the uptake of this product within their communities. Thirty aggregators also signed MoUs with an insurance broker to act as distributors of the product.

Strengthening access to inputs through digital platforms

Under the Kigoma and Kagera agribusiness consortia, AGRA built the capacity of higher-level (hub) agro-input dealers and VBAs, who are the primary link between smallholder farmers and village-based agro-input dealers.

The VBA model established by AGRA is a promising attempt to close the last mile of extension provision to smallholder farmers. VBAs are self-employed agents, including women and youth, who rapidly create demand for yield-enhancing inputs while teaching farmers good agricultural practices, aggregating produce and linking farmers to markets. Seed and fertilizer companies supply inputs to VBAs for demonstration and sale to farmers at the village level. Many VBAs progress into village-based agro-dealers/aggregators or agents of these companies. VBAs currently receive the improved varieties of fertilizer, seed, and other inputs for free from distributors for the purpose of demonstrating their use in "mother and baby" demonstration plots in the villages they serve. They then encourage farmers to go to the input dealer in their village to purchase the input packages. VBAs are trained by both public and private sector extension workers, with clear and consistent messages that lead to a "demonstration effect" for other farmers.

According to the Tanzania National Council for Financial Inclusion (NCFI), limited access to finance is key a constraint for the agriculture sector including agribusinesses, SMEs and rural populations. The major impediments to access to financial services for agriculture identified by the NCFI include the unstable macroeconomic environment; difficulty in enforcing contracts; limited understanding of financial products; limited range of financial products designed for the agriculture sector; and costs of reaching agribusinesses located in remote locations.[13]

Building sustainable agent networks that do not depend on donor funds or volunteering requires establishing business models that enable agents to earn a sustainable livelihood by providing a range of products and services. These can be offered either through direct sales or through commissions and/or fees, often from multiple service providers. Solutions should also provide farmers information about appropriate application of inputs and innovative financing tools in order to invest in the timely provision of quality fertilizers, improved seeds and other inputs.

Addressing these issues in an integrated and sustainable way has the potential to achieve optimal yields, and more broadly increase smallholder farmer incomes, food security and resilience to the effects of climate change.

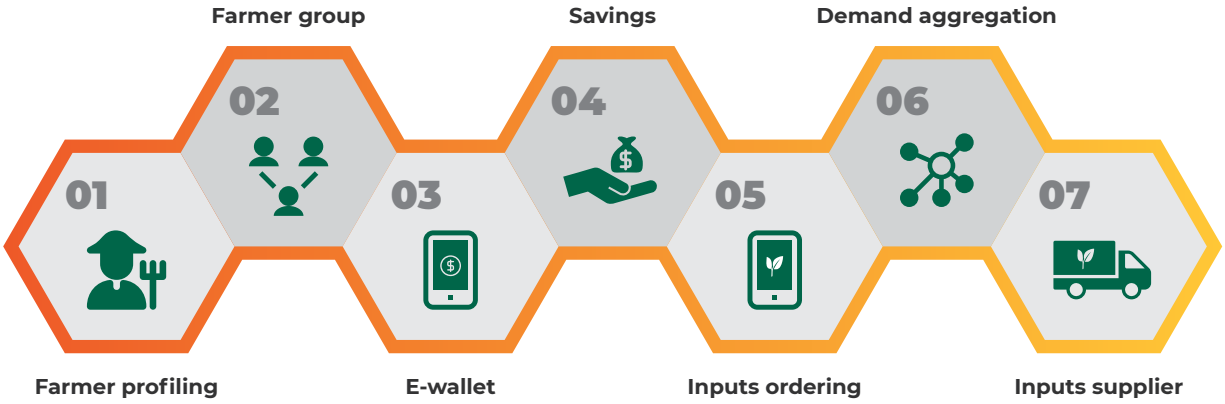
The solution

AGRA and Grameen Foundation USA invested US$312,068 to strengthen input access for smallholder farmers in Kigoma and Kagera regions through a digital ecosystem that enables the mobilization of savings, and aggregation and delivery of quality inputs for farmers. The implementing partner brought on board Bizy Tech, a fintech company that owns the digital platform *Kilimo Akiba* (agriculture savings) and TPB Bank (now called TCB Bank), a financial services provider.

Farmer groups were trained by VBAs on good agricultural practices and recommended inputs. Farmers were supported to make input orders and to start saving towards their input goals directly to their group account or their e-wallets via mobile money. The bank account was held with a partner financial services provider (TCB Bank). Once groups reached their savings goal, they received an SMS/IVR notification and the inputs would be distributed.

The solution aids rural farming households to act on the advisory services provided by VBAs and invest in quality inputs to optimize yields for family food security and/or to. The solution also facilitates sustainable trading relationships between VBAs and village-based agro-dealers. As a result of targeted input vouchers from a critical mass of farmers, village-based agro dealers can access bulk supplies and discounted prices from distributors, which can be passed on to farmers. The digital savings for input solution coupled with the VBA extension and advisory service model has tremendous potential for transforming market systems through practical and innovative ways for the market to work better for poor rural households and reduce vulnerability in the agriculture sector, especially in light of COVID-19.

13 Cambridge Economic Policy Associates Ltd. Global Agriculture and Food Security Program (GAFSP) Private Sector Window. October 2016



Source: Bizy Tech

Figure 51: How Kilimo Akiba works

Results

From this investment, 150 groups with a combined membership of 3,155 (42% female) farmers have been registered on the digital platform. The value of the total inputs ordered was US$47,826 (for fertilizer and seed). A total of 108 MT worth of inputs were ordered through the platform by the end of 2020, and 93 VBAs were trained and started working as commission agents for input companies and hub agro-dealers.

Weaknesses and Opportunities for improvement

Weakness

- The crop insurance product piloted under this thematic area unintentionally worked with individual farmers as vouchers were sold at the point of purchase of inputs, usually at the agro-dealer shop. While micro-insurance is the most appropriate mechanism for making farmers more resilient to shocks, it works better with groups rather than individuals because the cost to individuals is prohibitively high. Also, insurers find it cheaper to underwrite group risks compared to individual risks. For this case, the uptake was very low. Out of 6,090 farmers that had registered for crop insurance, only 156 paid the premium (less than 3%).
- Large banks are a good platform for the roll out of digital accounts at scale, but they need to invest in agency networks to make sure the accounts are being used, especially in rural areas. Agents working with banks that partnered with AGRA to launch digital payment services did not have enough liquidity to honor all the payments every day. This resulted in frustrations among adopters and low volumes of transactions.
- The investments in digital solutions were largely used to identify, train, and register farmers. The lack of a common standard registration or digital ID led to multiple registrations, cost inefficiencies and fatigue at farmer level.

Opportunities

- Rural digital financial services work best when they coordinate or bundle interrelated products and services that address farmers' highest priorities. Four critical ingredients for farmers' livelihoods need to be united: relevant financial and non-financial services, reliable market access, high-priority inputs, and skills in agricultural practices, financial management and digital literacy. Service providers should deliver these through a combination of technology and in-person engagement, and digital platforms present an opportunity to efficiently coordinate the offerings of multiple actors.
- A continuum of short-term to long-term in-person engagement is required to foster usage of digital services among rural populations. While barriers such as mobile infrastructure, digital payment availability and farm-

level data are likely to require gradually less human engagement, activities such as client-level training, marketing, and building trust will necessitate in-person support on an ongoing basis.

- Opportunity to increase efficiency and create synergies – sharing human resources can make rural outreach sustainable if stakeholder incentives are demand-driven and well aligned. All of the actors offering financial services, market access, inputs or training have some level of human touch in the field (staff, agents) but they struggle to make such in-person outreach sustainable. When the partners' service offerings are interrelated and their incentives are well aligned, sharing human resources (whether formally or informally) can reduce operational costs, increase efficiency and permit better customer service delivery. The experience of AGRA and its partners points towards a high potential for collaboration and coordination of in-person service delivery.
- There is an opportunity for government interventions that work on data sharing and/or digital ID to spearhead integration of databases, avoid multiple registrations, and make deployment of digital solutions more affordable and accessible.

Conclusion

There is need to catalyse partnerships that bring together interrelated, high-priority services for farmers. While their goals, incentives, strengths and weaknesses may be complementary, stakeholders often require a catalyst and support to design, test and operationalize win-win partnerships. Financial service providers, aggregators, input suppliers and telecommunication companies should be encouraged to collaborate on digital technology and to experiment with sharing data as well as human resources to make overall service delivery cost-effective and sustainable. AGRA has played a role by providing funding for research, development and piloting, along with human-centered design and other technical assistance to broker strong partnerships, stimulate meaningful data collection and application, and field test sustainable operations. Investing in consortia and in business model analysis and multi-stakeholder engagement, AGRA has united key actors and stimulated innovation and collaboration. There is still a strong need for such support to encourage proactive aligning of incentives and activities to meet shared goals.

Digitization has revolutionized financial inclusion, making it feasible to extend a range of financial services, market access and other services more affordably to rural farmers. However, in-person engagement is still needed to complement digital solutions throughout the customer journey. As farmers' knowledge, experience and trust in digital services grow, the nature of in-person engagements will change. Non-financial services, such as digital literacy training, are vital for the uptake and sustainable use of income-generating financial and market services. As such, they can be rolled into business models and their costs covered by revenues from associated services. Stakeholders can leverage digital technology to increase smallholder financial and market inclusion, improve agricultural livelihoods and rejuvenate rural economies in sub-Saharan Africa

AGRA's investment in the organizations pursuing innovations in mechanization has fuelled the development of private sector solutions. These investments have built a business case to serve smallholder farmers. The funding provided operational room for experimentation, which incentivized and enabled the partners to test riskier ideas, and deepen their understanding of smallholder farmer needs to better tailor their services to reach a more grassroots market. The partners leveraged AGRA's grant funds and technical assistance to establish value chain and financial linkages that might not otherwise have occurred but were likely to endure. However, more support is required to ensure that farmers increase farm productivity and net incomes in order to achieve the goals of all actors and keep the farm mechanization ecosystem functional.

Acknowledgements

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9. Enhancing Policy and Regulatory Environment in Support of Integrated Downstream Delivery

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Key Messages

- AGRA's interventions through policy and state capability have made an important contribution in supporting an enabling policy, regulatory, and institutional environment for agribusinesses operating in different value chains.
- Unlocking sustainable growth and inclusive agricultural transformation requires a combination of policy and state capability interventions to complement system development work conducted under the consortia program.
- AGRA strategy in this space involves working with local organizations, particularly the umbrella private organizations such as Tanzania Seed Traders Association (TASTA), Fertilizer Society of Tanzania (FST), ACT, and SAGCOT, and local think tanks such as ESRF, to drive the reforms agenda.
- Reforms activities revolve around the policy cycle that covers (i) identification and prioritization of bottlenecks (ii) appraisal of reform options through ex ante impact assessment and legal analysis (iii) intensive stakeholder consultations (iv) approval through the bureaucratic channels (v) legislation, and (vi) implementation.
- The flagship project developed by the Government of Tanzania with AGRA's technical and financial support provided a mechanism for mobilizing and coordinating investments into the agriculture sector.

Keywords

enabling policy and regulatory reforms, state capability, policy implementation, flagship, political economy

Introduction

This chapter lays out AGRA's interventions in policy and state capability that facilitated the creation of an enabling business environment for agribusinesses. To demonstrate AGRA's role, the chapter is organized into three key sections. The first section outlines the specific interventions made by AGRA across various sectors. The second discusses AGRA's approach and the underlying principles that shaped its guiding framework when designing interventions. The third section outlines the outcomes of these interventions.

AGRA's policy interventions

In Tanzania, AGRA deployed several interventions to enhance the policy, regulatory, and institutional environment for investment in agricultural value chains. These interventions, outlined in Table 20, were focused on strengthening

policy, regulatory and institutional environments for farmers and agribusinesses in the country. The delivery model involved the use of integrated consortia.

Table 20: AGRA supported interventions under policy and state capability body of work in Tanzania

Intervention	Focus area
Micro Reforms for Agribusiness (MIRA)	Reforming problem policies, regulations and administrative practices that deter private sector investment in the agribusiness value chain.
Strengthening Food Security and Export Trade in Tanzania (SFSETT)	Strengthening public systems for predicting and monitoring food security in the country, and reliable data for decision-making on trade and food security.
Policy Advocacy for Strengthened and Accelerated Agricultural Reforms (PASAAR)	Improving Tanzania's scorecard on the Comprehensive Africa Agriculture Development Programme (CAADP) mutual accountability framework; advocacy for fiscal reforms, SPS and post-harvest strategies.
Strengthening Coordination of ASDPII Implementation at the Local Government Authorities (SCALGA)	Development of quality District Agricultural Development Plans (DADPs) and crowding of agricultural investments in the LGAs.
Tanzania Agro-Industrialization Development Flagship (TAIDF)	Support the government to develop a flagship plan for accelerating agro-industrialization.
Policy nodes and hubs	Reforms around five thematic areas: seeds, fertilizer, market access, climate change and land.
Institutional Capacity Assessment (ICA)	A study to assess policy and institutional capacity of the government's ministries, departments, and agencies (MDAs) serving the agricultural sector.

In order to achieve the desired policy reforms, AGRA conducted an institutional capacity assessment of the public institutions involved in agricultural development to identify weaknesses and gaps. Recommendations from that study were used to design capacity strengthening interventions targeting key institutions.

High-level engagement with government officials and in-country development partners is yet another strategy that AGRA adopted to find leverage and synergy in its program in Tanzania. A good example of this synergy is in the coordination and implementation of consortia where the regional administrative secretariats provided the platform for coordinating the implementing partners. It has also supported the joint sector reviews and biannual reviews for tracking and monitoring progress in the agricultural sector, in line with the CAADP framework.

The sections below provide a brief description of each of the key interventions carried out around policy and state capability, and the emerging impacts and outcomes.

Micro Reforms for Agribusinesses (MIRA) Program

The MIRA project between 2015 and 2018 covered five thematic areas as outlined in Table 21. MIRA's goal was to measurably improve policy and regulatory environments for investing in local agribusinesses either selling inputs to or buying outputs from smallholder farmers in Tanzania. Through this program, AGRA supported both the government and the private sector to coordinate, monitor, and drive the activities for identifying, prioritizing, and reforming specific agricultural regulations that limited private sector investments in agribusiness value chains. Examples of reforms supported under the MIRA program include the seed and fertilizer regulations of 2017, which provided a conducive environment for private seed companies to access publicly registered early generation seeds for multiplication, and to register new fertilizer products.

Table 21: Specific policy and regulatory reforms supported under the MIRA program

Thematic area	Specific action implemented	Name of the policy/ regulations reformed	Impact so far
Seeds	Reviewed Ministerial Circular 2011 to make it easier and faster for the private seed companies to apply and obtain access to breeder seed of publicly bred varieties and hybrids	Ministerial Circular on Authorization of New Varieties of Plants 2017	Seven seed companies have obtained access to germplasm of 33 varieties of hybrids, multiplied the germplasm into foundation and certified seeds. Resulted in improved access to certified seeds.
Fertilizers	Revising regulations on the introduction and quality of new fertilizer blends	Fertilizer Regulations 2017	Reform resulted in reduction of testing period for new products from three years to one year, and reduction of testing fee from US$30,000 to US$10,000
Agricultural markets	Implementing a cost-effective grain export permit system for regulating grain availability	2017 change in administrative procedures and modalities for the issuance of export permits	Reformed institutional arrangements for applying and issuing export permits, including change from manual to online management of export permits[14]
Agricultural finance	Reforming contract farming legislation by putting in place specific agricultural contract law.	Contract Farming Bill (2019) – awaiting enactment	Developed best-practice model of contract farming law that is a component of the Agriculture Act currently undergoing development

Strengthening Food Security and Export Trade in Tanzania (SFSETT)

AGRA developed this project in response to a written request from the Minister of Agriculture to strengthen systems for monitoring and predicting food production and consumption in the country. The background of this request was the export ban that the government had imposed in 2017. This government decision drew criticism from the industry because of disruptions to cross-border trade, given that exports constitute a significant share of market opportunity for agricultural producers, especially maize, beans and rice farmers. The government recommended that the Economic and Social Research Foundation (ESRF), a local think-tank based in Dar es Salaam, lead the project in collaboration and coordination with a taskforce drawn from the Agriculture ministry and the other agriculture sector lead ministries. The objective was to provide a system that ensured reliable data and information related to food security and trade to promote informed decision-making and predictability in food trade.

Policy Advocacy to Strengthen & Accelerate Agricultural Reforms in Tanzania (PASAAR)

AGRA started to implement this project in November 2018, with the intention of supporting Tanzania to improve its performance in the CAADP mutual accountability framework. Following the first biannual review report in February 2018, Tanzania ranked poorly (3.1) and was the least performing among the East African countries (Africa Union, 2018). The Minister for Agriculture signed a compact with AGRA on improving Tanzania's performance, which resulted in the development of the PASAAR project. The CAADP mutual accountability framework, and the biannual review process in particular, provides a useful summary index to assess progress that countries are making towards achieving the goals of agricultural transformation set by the Africa Union (AU) by 2025. The project was implemented

14 https://atmis.kilimo.go.tz/atmis/tz/co/infowise/amis4t/home/homeuc.jsf

through a collaborative arrangement between Agriculture Non-State Actors Forum (ANSAF) and the MoA-based CAADP focal office, and demonstrated the benefits of public-private partnerships in advancing policy objectives. The successes of this intervention are further discussed under the achievements sub-section of this chapter.

Strengthening Coordination of ASDPII in Local Government Authorities (SCALGA)

This project provides technical and financial support to the President's Office in charge of Rural Administration and Local Government. Its aim is to enhance vertical and horizontal coordination of ASDPII implementation at the LGA level by working with 30 LGAs in 12 regions. The project also contributes to capacity improvement for planning, design, and implementation of the DADPs. The theory of change of this project is predicated on the premise that quality DADPs will crowd-in agricultural investments and catalyze agricultural transformation within the projects' target LGAs, coupled with enhanced coordination through the value chain-based stakeholder platforms it creates and activates.

Tanzania Agro-industrialization Development Flagship (TAIDF)

AGRA provided technical support to the government of Tanzania through the Technical Committee of Directors to develop a comprehensive flagship program known as the Tanzania Agro-Industrialization Development Flagship. TAIDF is a government framework for mobilizing and coordinating investments towards agro-industrialization in Tanzania. The secretariat of the ASDPII designed the framework through a process of extensive consultation with various agro-industry stakeholders, including government representatives, development partners, the private sector, farmer organizations, research, and academic institutions and civil society.

The flagship has three components: (i) infrastructure, support services, and incentives for agro-industrial development, (ii) agriculture modernization and intensification, and (iii) support for individual and institutional capacity strengthening for effective agro-industrialization. Figure 48 presents the conceptual framework envisaged under TAIDF.

The government and development partners are expected to invest $320 million within the first six years, and investments will largely target the provision of infrastructure, services, and administrative and institutional support. Government and donor investments are expected to leverage those of the private sector during the same period.

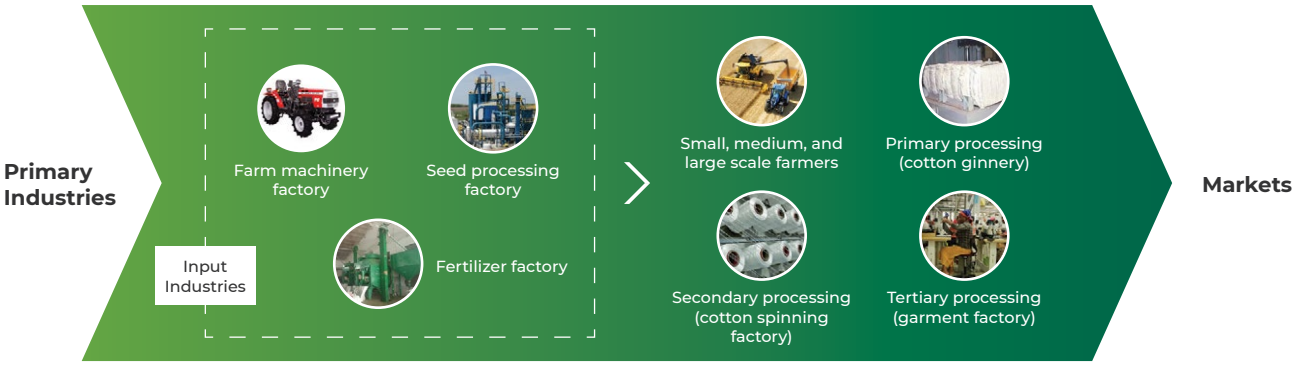


Figure 52: Conceptual framework for the TAIDF transformative pathway

Implementation Modalities

The mode of implementation of policy, regulatory, and institutional reforms comprised four major pillars:

a) Supporting the planning and execution of projects to drive and coordinate reform activities.

b) Engagement with government and other partners in the Tanzania policy community to advocate improvements in the business environment for agricultural transformation,

c) Conducting political economy studies to generate evidence, such as reform impact assessments (RIAs) that have been used to justify calls for specific agricultural reforms.

d) Strengthening continental, regional, and government multi-sectoral coordination, and mutual accountability in the agriculture sector.

A key strategy for AGRA was to collaborate with umbrella private sector associations such as TASTA, FST, and ACT to coordinate specific policy and regulatory reforms beneficial to agribusinesses and farmers. AGRA also worked with local think tanks such as ESRF and the Policy Analysis Group (PAG) to coordinate, monitor and drive policy reforms in Tanzania.

Further, AGRA commissioned economic and legal analyses around specific policy and regulatory issues. For instance, the economic analysis conducted by ESRF in 2017, with funding and technical support from AGRA, was instrumental in informing policy debates around the impact of export bans. It subsequently contributed to the decision to remove export bans in 2018 (National Parliament, 2018). An important output from the legal analysis is the contract farming law for Tanzania, which is now anchored in MoA and is a chapter in the Agriculture Act currently undergoing development. Other evidence-generation activities have focused on supporting Tanzania to improve its performance in the CAADP mutual accountability framework.

Major Achievements of the Policy and State Capability Work in Tanzania

This section highlights key outputs of policy and state capability interventions, and identifies the institutions that have adopted these outputs and how they apply these reforms. Further, it discusses the changes in system functionality that have been produced by the policy work.

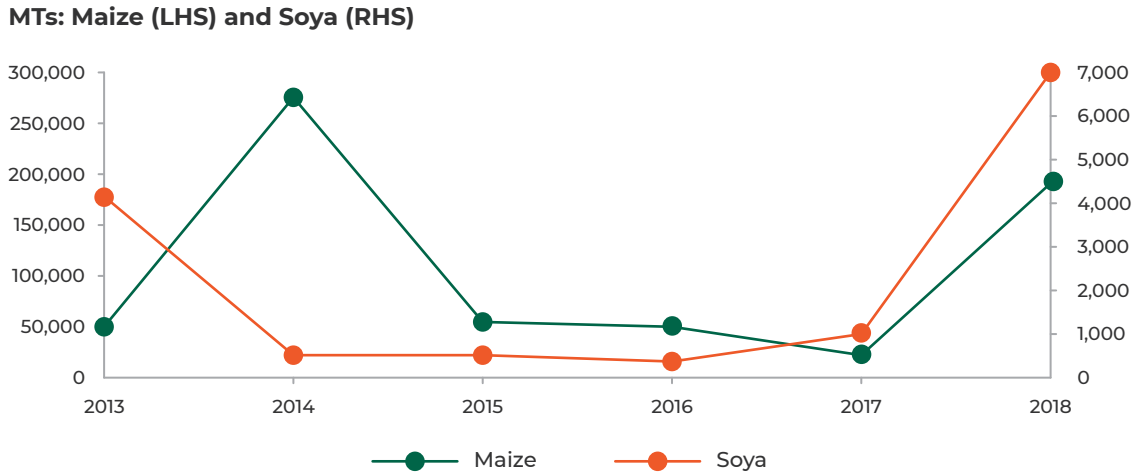
Removal of export bans

The Government of Tanzania has often imposed export bans as an instrument for safeguarding the country's food security. However, export bans have caused severe unintended effects such as the unpredictability of cross-border trade, and loss of markets for surplus farm production and loss of incomes. For example, in 2017, many farmers and traders were left with millions of tons of maize they could not sell as a result of export bans.

Officially, the Minister for Agriculture removed export bans through his statement in the ministry's budget for 2018/2019, vide clause 116:

> *Mr. Speaker, in order to improve access to markets for food products, especially maize, the Ministry has lifted the ban on the export of these products (Export Ban). In addition, the Ministry in collaboration with AGRA and other stakeholders will conduct research that will help establish an alternative system that will improve the sustainable trade of these products locally and abroad. The system systematically provides accurate data on production, demand, and surplus food in the country as well as monitoring the trends of domestic and foreign markets without affecting the food security situation in the country (National Parliament, 2018).*

The removal of export bans and easing of issuance of export permits through online systems have engendered predictability in export trade and reduced the waiting time, respectively. Figure 49 illustrates the impact of the reform of this policy on export volumes for maize and soyabean. Though this policy intervention was implemented under a separate policy and advocacy project, the resulting reforms benefited the consortia because they eased access to cross-border markets.



Source: FAOSTAT, 2020

Figure 53: Recovery of maize and soya export volumes

Post-harvest strategy and implementation plan

Tanzania, like other developing countries, fcaes the problem of post-harvest losses, which increase food insecurity and reduce household incomes. For instance, a study by Boni et al (2021) revealed that in some districts in Tanzania, up to 80% of sampled maize was contaminated with aflatoxin. The mean aflatoxin level from that study was 12.47 µg/kg while the highest level was 162.40 µg/Kg. On the other hand, the ASDPII (2018) estimates post-harvest losses at 25%-35% depending on the type of crop.

To avert the negative impact of post-harvest losses, AGRA's interventions focused on:

1. The development of a post-harvest strategy and implementation plan.
2. A political economy study on the potential benefits of fiscal reforms on the adoption of post-harvest technologies such as hermetic bags.
3. Advocacy for reforms that will catalyze adoption of technologies and practices that reduce post-harvest losses.

The government adopted the post-harvest strategy and its implementation plan, with the former Vice President Samia Suluhu launching the document in August 2019. There are now systematic and focused efforts to reduce post-harvest losses. For instance, the adoption of hermetic storage technologies has increased in recent years, resulting in the reduction of post-harvest losses.

Increased mutual accountability in agriculture

Tanzania is a signatory to the 2014 African Union (AU) Malabo declaration, which focuses on achieving agriculture growth and transformation on the continent by 2025. Alongside other countries, Tanzania has also committed to mutual accountability for results and is thus subject to a biennial result review to assess progress towards attaining Malabo targets. In the first review in February 2018, Tanzania was found to be off-track, with the least performance score among the East Africa countries.

Subsequent intervention by AGRA resulted in buy-in by government where the CAADP focal office at MoA, together with ANSAF, became co-implementers of a project to strengthen Tanzania's progress in the mutual accountability framework. Systems for data collection, analysis and collation were set up at MoA, and champions nominated from different ministries and trained on the CAADP reporting tools. Two years later, Tanzania's score rose from 3.1 to 5.08 (Africa Union, 2020), putting Tanzania on track towards attaining the mutual accountability objectives.

Private seed companies access to public registered EGS

The seed sector reforms in Tanzania supported by AGRA allowed private seed companies access to pre-basic and basic seeds of publicly protected varieties and hybrids. To that effect, the Minister of Agriculture officially gazetted the new circular authorizing access to new registered crop varieties of plants on 20 January 2017 (MoA, 2017). That reform enabled seven seed companies to obtain access to germplasm of 33 varieties and hybrids, multiply them into foundation and certified seed and to offer these for sale under the company's brand names. TASTA has indicated that policy and regulatory reforms resulted in an increase in the number of private seed companies licenced to access and multiply protected public breeders' seeds. TASTA was an AGRA grantee under the MIRA project when it coordinated this reform to liberalize access to public registered EGS.

Improved planning, coordination, extension and performance of agricultural programs

Together with PO-RALG, AGRA has supported the coordination of ASDPII implementation in 30 LGAs across 12 regions. The LGAs can now prepare their own DADPs, prioritizing their unique and available opportunities. The DADPs are tools for attracting agricultural investments into the LGA because they are the business plans that outline the investment opportunities available within the individual LGAs. The stakeholder platforms coordinated by the Regional Administrative Secretariat offices provide forums for synergy between the different agricultural development actors, thus avoiding duplication of programs and projects.

The LGAs that were supported now use the DADPs to prioritize agriculture investments in their districts and for mobilizing the resources required for agricultural development, filling an important funding gap to agriculture from the central government. In the fiscal year 2021/2022, the supported LGAs budgeted $2.8m from their own internal resources towards the implementation of DADPs.

Positive Effects of Policy and Regulatory Wins on the Emerging Business Sub-Consortia

Policy reforms supported by AGRA in Tanzania have helped the emerging sub-consortia to develop to scale and attain sustainability. Kaderes Peasant Development (KPD) Business Sub-Consortia and Rugara Beans Sub-Consortia are in the business of aggregating beans from farmers and selling to export and local markets. While KPD BSC collects 20,000 MT of beans annually, 40% of which are exported to Kenya and Asia, Rugara Beans BSC collects 1,5000 MT of beans annually, exporting more than 65% to neighbouring countries.

Without an export market, these two BSCs would not have grown to scale or become large enough to sustainably absorb produce from farmers. This has been made possible through the reforms in cross-border trade and easing of the process of obtaining export permits. Before the removal of export bans, there was an outcry from businesses and farmers about the lack of markets and low commodity prices, with farmers and businesses holding large volumes of produce that they were unable to sell.

Reforms in the registration of fertilizers as reflected in the 2017 regulations have also helped to anchor the emerging BSC. For example, Fantashiru Enterprise BSC in the SUKA Consortium and the Silverlands BSC in the Ihemi-Ludewa Consortium rely on supplies of quality fertilizer from large companies such as Yara. The two main fertilizer reforms that took place in 2017 are the improved regulations for registering new fertilizer products, including new blends, and the rationalization of government agencies that have mandates on fertilizer imports. Following these reforms, fertilizer imports increased by 23% from 417,242 MT in 2017 to 511,510 MT in 2018. Fertilizer use in SUKA was on average 12.6 kg per acre of arable land, which increased to about 20 kg per acre after the reforms. There was also an increase in the number of agro-inputs shops, from 78 in 2017 to about 338 in mid-2020, according to the SUKA Consortium report.

Seed sector reforms, including improved access to registered public varieties and removal of cess have also contributed to the emergence and anchoring of the BSC. For instance, TARI and private seed companies such as Beula, Namburi, Suba Agro and Meru Agro are major players in the Super Seki Iwawa BSC, Fantashiru Enterprise BSC, and Silverlands BSC. The reforms have resulted in more production and commercialization of EGS, and

higher production of improved seeds by Suba Agro and Meru Agro in Kigoma and Kagera, two regions that did not have private improved seed multiplication before the AGRA-supported consortiums were established.

Weaknesses and Opportunities for Improvement

- The policy reform process is a complex time-consuming activity and requires negotiation with different interest groups. For instance, AGRA supported the process of developing the contract farming law from 2018, however, by the end of 2021, it was yet to be enacted. To fast-track policy reform processes, there is an opportunity to ensure effective engagement of key stakeholders, especially government officials, at every step.
- There is a gap between policy/regulatory reforms and implementation (reforms are not an end in themselves). For example, after the reforms allowing private companies to access publicly registered seed varieties, only seven local companies out of 20 have taken advantage of the reforms. Opportunities for improvement include better communication and awareness of reformed polices and regulations, and advocacy for budgetary allocation towards policy implementation.
- To drive effective and sustainable policy and state capability interventions at national and local government levels, it's critical to balance short-term interventions (technical assistance) and initiatives that build in-house capacity of key competencies and skills.

Conclusions

The chapter has described the role that AGRA's policy and state capability work plays in creating an enabling business environment for agribusinesses. It has also demonstrated the critical role of this body of work in anchoring and promoting the sustainability of the efforts in downstream systems development and partnerships. Better policies and regulations complemented the work that was done through the consortia and created the conducive conditions for the emergence of the BSC, which in turn, led to higher adoption of improved agricultural inputs such as seed and fertilizer, and predictable cross-border trade. However, the reform process has been complex and slow, resulting in limited implementation. A participatory policy-making process and deliberate capacity building approach for policy stakeholders could potentially accelerate the reforms and enhance implementation.

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10. Key Results and Learnings from the Integrated Agribusiness Consortia in Tanzania

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Introduction

The overall AGRA program in Tanzania during the 2017-2021 period included interventions that cut across three main bodies of work: systems development, partnerships, and policy and state capability. The results reported in this chapter are largely from time-series data, periodic surveys and assessments, and special studies. AGRA's M&E system allows for direct data entry by implementing partners and has an automated analytics module. This chapter summarizes achievements in the areas of access to markets, partnerships, private sector investments, access to finance, private sector-led extension, and policy and state capability.

Access to Markets

This section discusses the performance of the output markets component of the consortia intervention (local, national, and cross-border).

Investment to increase the capacity of traders and processors

Traders and processors capacity is crucial to improving farmers' access to output markets. Through integration and coordination of agricultural systems and availing market opportunities, traders and processors were able to invest in market infrastructure, including storage and processing facilities. Most of these investments were made by local SMEs in the areas targeted by the different consortia. As shown in Table 22, the storage capacity expanded more than three-fold during program implementation.

Table 22: Investments in warehouses in terms of storage capacity

Area of intervention	Capacity (MT) before consortia	Capacity (MT) after the consortia
Kigoma	5,573	20,543
Kagera	1,324	8,750
Ihemi-Ludewa	55,000	132,500
SUKA	20,385	43,858
Total	**61,897**	**205,651**

The volume that smallholder farmers sold to these SMEs also increased from approximately 121,237 MT in 2017 to 391,781 MT in June 2020.

Box 14: Improved storage capacity gaining momentum in consortia geographies

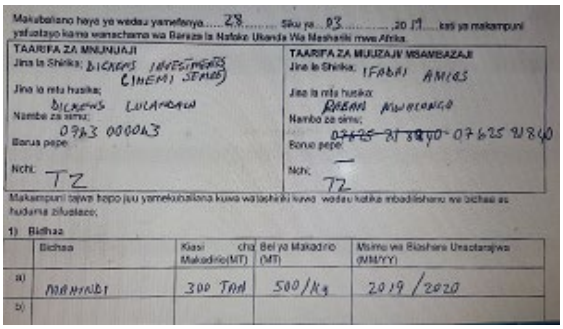
MEMA Holdings is installing 2,000 MT capacity metal silos in Manyara Region. The company's long-term plan is to extend the storage/handling and cleaning capacity to 10,000 MT. Other off-takers, such as Real World Ltd and Mama Seki Millers, have each acquired metal silos with the capacity to store 1,000 MT of maize in Songea and Njombe regions, respectively. Large and medium-scale agro-processors are also expanding their handling and processing capacities because of an expanded producer base that guarantees higher volumes of the right quality and quantity. Farmers have also demonstrated increased willingness to pay for warehousing services to preserve the quality of their harvest. SMEs dealing in crop aggregation, processing, and trading, are expanding farmers' access to national and export markets.

Increased off-takers' commitment to purchase from AMCOS

One of the intended objectives of AGRA's investments through integrated agribusiness consortia was to increase participation of AMCOS in input and output markets. These organizations provided key services to farmers, including aggregation of demand for input, collective storage, and marketing.

A total of 95 supply agreements were secured by AMCOS during the 2019/2020 season for maize, beans, rice and soybeans, mainly within the emerging business sub-consortia described in the previous chapters.

This is a purchase order between Super Seki and Kilumba AMCOS to purchase 200 MT of maize and 10 MT of beans from the AMCOS.



This is a purchase order between Dickens Investment and Hifadhi AMCOS to purchase 300 MT of maize. Farmers do not go through the hassle of looking for buyers at harvest as they have a guaranteed market.

Figure 54: Simple documentation for collective marketing by AMCOS

Furthermore, off-takers are providing extension services and input loans to ensure that farmers produce high-quality produce and deliver the right quantity at the right time. On the side of the AMCOS, their aggregation centres are showing signs of becoming commercially viable as more farmers are willing to pay for storage services. Moreover, where AMCOS are not present, off-takers hire aggregators.

Expanded access to existing and new markets

To ensure that emerging BSC supply high quality produce to domestic and export markets, AGRA used technical assistance to de-risk off-takers investments in the expansion of their storage and processing capacity. AGRA's technical assistance in trade facilitation enabled traders to access export markets and adopt business models that assured premium price for high-quality produce. For example, G2L exports beans to Belgium, Silverlands exports beans to South Africa, Super Seki exports fortified flour to Kifaru Millers in Kenya, and Dickens exports maize to the DRC.

Agribusiness consortia also enabled smallholder farmers to transition from subsistence farming to market-oriented agriculture. Simple gross margin analysis was a key tool introduced to enable smallholder farmers to make decisions based on business principles, thereby decreasing costs and risks while increasing profits. The expanded access to existing and new markets improved the commercialization of crops, hence increasing the volume sold from 121,237 to 391,781 MT.

Table 23: Volume sold under structured arrangement before and after interventions

Area of intervention	Market before interventions (quantity sold in MT)	Existing and new markets after interventions (quantity sold in MT)
Kigoma	14,200	52,556
Kagera	15,637	52,517
Ihemi	13,000	77,704
SUKA	28,400	62,004
YWS	50,000	147,000
Total	**121,237**	**391,781**

To exploit expanding market opportunities, farmer organizations formed market committees to drive the proactive search for markets and price negotiations. Such committees were mainstreamed across the consortia. AGRA and its partners strengthened these committees' capacity to identify, assess, negotiate, and respond to opportunities. Box 14 describes the composition and function of market committees.

Box 14: Composition and functions of farmer market committees

Agriculture Council of Tanzania (ACT) was one of AGRA's partners. Focused on building the capacity of farmer groups to find buyers, ACT trained the farmers on quality requirements and group management. Emphasis was placed on working with formal (registered) groups and formalizing the informal ones to be able to access larger and formal markets. Furthermore, ACT formed marketing committees within the farmer groups, composed of 4–6 famers who search for market opportunities. ACT provided backstopping support aimed at institutionalizing these committees to ensure the sustainability of their intervention.

Farmers' marketing committees within the AMCOS are tasked with finding markets while providing feedback to fellow farmers on the preferences and requirements of the market. The main purpose is to create direct linkages between off-takers and farmers. After identifying buyers, the committees organize meetings at village level between farmers and buyers to discuss volumes, quality and prices. Buyers are willing to pay a higher price if the quality requirements are met. Agreements with farmers are made just before harvest season, as buyers usually want to agree on prices after generally assessing the availability of produce in the market.

Source: KIT Royal Tropical Institute, 2019

Leveraging Private Sector Investments

SMEs make up about 50% of Tanzania's GDP while generating up to 40% of total employment (Matchmaker, 2019). In all the BSC described in previous chapters, SMEs are the key investors. The new investments in storage and processing capacities leveraged an equivalent of approximately US$22.3 million during the program implementation period (See Table 24). It is expected that this will increase rapidly due to the business growth under the BSC.

The case of Annaviola Walker (Box 14), who is based in Iringa, provides evidence of the rapid expansion of SMEs due to the BSC. In 2015, she started selling hermetic storage bags as a member of the consortium under the YieldWise initiative with a capital of US$4,100. By the end of 2019, she was handling about 2,700 bags per season and her working capital had increased to US$8,100, making a profit of US$949 from sales of hermetic storage bags.

Table 24: Value of investments leveraged from the private sector

Item	Investment (US$)
Warehouse	675,360
Agro-dealers (Credit)	3,024,475
Equity financing for input companies (seeds and fertilizer)	7,956,871
Loans to AMCOS from banks	1,633,478
Loans to SME`s	3,024,475
Investments in seeds infrastructure	382,041
Other investments	5,601,455
Total	**22,298,155**

Box 16: Emerging hermetic technology distributor

Annaviola Walker

- Started selling PICS bags in Iringa in June 2015
- Has three outlets that include two agro-dealers and the Tanzania farmers association in Iringa
- Sells approximately 200 bags per week
- Sells bags in agriculture trade fairs organized by the Ministry of Agriculture, farmer associations, and NGOs

	Units	TZS Purchase Price	TZS Sales Price	TZS Profit	Working Capital	USD Profit	USD Working Capital	Margins
1st order	200	3,600	4,000	80,000	720,000	37.38	336.45	11%
2nd order	500	3,400	4,000	300,000	1,700,000	140.19	794.39	18%
3rd order	1,500	3,100	4,000	1,350,000	4,650,000	630.84	2,172.90	29%
4th order	500	3,400	4,000	300,000	1,700,000	140.19	794.39	18%
Total	2,700			2,030,000	8,770,000	948.60	4,098.13	

Access to Alternative Finance

Lack of capital is one of the bottlenecks to the agriculture sector's realization of its full potential. To increase the flow of capital through agricultural value chains, AGRA worked with financial institutions, agri-businesses, and farmers to design and deploy innovative financial products and approaches. These included partnerships with financial institutions to develop innovative pro-poor financial products, establishing de-risking facilities through loan guarantees and building relationships between producers and financial service providers as well as value chains and trade finance.

These initiatives resulted in reductions in the cost of accessing loans from banks and other financial institutions, from

a 24% interest rate to between 10% and 18%.[15] Improved coordination and joint ventures led to the development of new products and the customization of existing products to respond to the needs of smallholder farmers and SMEs investing in staple food value chains. As a result, since 2017, over 400,000 farmers and about 250 SMEs have accessed loans from banks and input companies valued at US$11.4 million (80% and 20%, respectively). By 2020, the loan repayment rate was over 85%.

Table 25: Customized financial products available for farmers and SMEs

Type of product	Product description	Financial institution
Pamoja Account	This account is designed specifically for groups. The account has no opening charges and no monthly charges	NMB
Simbanking	This is a bank product whereby users (farmers) use their mobile phone SIM card as a bank account	CRDB
Mcoba Account	This is a saving account for groups in which TPB and Vodacom have partnered to support savings for farmer groups. Every member gets a notification when savings are deposited, and credit is applied for on behalf of the group	TPB
Tabasamu Saving Account	A special account for women	TPB
Farm input loan	Farmer organizations input loans	NMB and CRDB
Processors storage support credit	This is a credit facility to support cereal processors to establish steel silos. It includes a 30% grant on the total CAPEX	TADB
Post-harvest technology credit	It is a credit facility to support agro-dealers to purchase post-harvest technologies (e.g. tarpaulins and hermetic bags) and distribute them to farmers	TPB

Box 16: TADB's special loan for SMEs

In 2019, TADB launched the Special Purpose Agricultural Loan Facility (SPALF) aimed at financing SMEs for the acquisition of modern post-harvest technologies. This was an innovative product that combined capital expenditure loans and working capital for improved loan repayment. The loan product targeted SMEs willing to invest in the purchase of steel silos with the capacity to store a minimum of 500 MT or to purchase grain milling plants with a capacity of milling 30 MT per day. AGRA's matching grant covered 30% of the equipment cost up to a maximum of US$80,000 for the steel silos and US$40,000 for the milling machines. The matching grants issued were valued at US$610,000 and leveraged private sector investments worth US$7 million.

Private Sector-led Extension

To increase access to high-quality produce and increase demand for improved agricultural inputs, off-takers and input companies started to provide extension services to smallholder farmers. Agribusinesses that supply inputs and post-harvest management technologies or those who source from smallholder farmers increasingly invested upstream to stimulate demand for improved seed and fertilizer. Traders and processors were also engaged in

15 Financial loan products that AGRA developed with banks were charging interest rates ranging from 12% to 17% per annum as compared to the 17.4% charged on other loan products by commercial banks in 2018

training farmers on crop quality management and delivery logistics. This engagement enabled smallholder farmers to guarantee the availability of produce in the right quantity and quality.

Input supply companies provided extension, including demonstration plots, as part of their marketing strategy. This mostly involved demonstrating the use and performance of their technologies (e.g. hybrid seeds, fertilizers and crop protection products). Agrochemical companies also delivered extension advice through agro-dealers, demonstrations during farmer field days, and setting up demonstration plots to showcase their technologies and other innovations. In 2018/2019 and 2019/2020 seed companies established over 3,000 demonstration plots in the consortia areas. The companies also deployed enough personnel on the ground to continue offering extension support to farmers. Figure 55 shows the technology and good agricultural practice adoption pathways.

De-risking the first movers (supply and demand side) of new improved technologies:

- Government subsidies to create the **demand for improved technologies**
- Grants to **technology suppliers** to de-risk their investment before the development of markets/sufficient demand (seed companies, fertilizer blenders, etc.)
- Building **last-mile delivery mechanisms** (e.g. agro-dealers, VBAs)
- Technical assistance to ecosystem partners to sustain the adoption and increase the **flow of capital** through the supply chains (moving from subsidies and grants, to blended finance and innovative financial products)

Figure 55: Technology and good agricultural practices adoption pathways

Box 18: Private sector companies providing extension services

Kaderes Pesants Development hired 14 staff who provided extension services in Kagera Region to ensure farmers produce high-quality beans for the export market. Kitutu Enterprises in Kigoma Region hired five staff located in Kasulu District Council to provide extension services to farmers. The role of these extension officers was to ensure farmers produce high-quality maize and beans for Kitutu Enterprises. Silverlands in Iringa offered extension services to farmers to help them meet the quality standards required for its animal feeds business. The company set up 165 demonstration plots in the Southern Highlands, providing seed, fertilizer and herbicides to 165 village-based advisors who worked with smallholder farmers. In the SUKA Consortium, Nondo Investors Company hired six extension agents to train farmers on good agricultural practice and quality assurance.

Access to Inputs

AGRA partnered with private sector companies to stimulate demand for improved seed and fertilizer in the consortia geographies. These companies re-directed their marketing budgets to creating demonstration effect through small-packs and demonstration plots. During the 2018/2019 and 2019/20 farming seasons, Meru Agro, Suba Agro, Agriseed, Beula, Western Seed, Pannar, Syngenta, Kipato and Namburi contributed a total of 249,843 small packs of maize seed (50 grams each) that were distributed to farmers in Iringa, Njombe, Ruvuma, Rukwa, Katavi, Kagera and Kigoma for smallholder farmers to gain practical experience of the performance of different improved seed and associated technologies. The small packs contributed to awareness creation among smallholder farmers on the benefits of adopting improved seed. Private sector-led extension complimented the work of public sector extension agents and led to increased demand. This triggered an increased demand for the improved seed with the total value of inputs bought by smallholder farmers in the consortia target areas increasing from US$8.34 million in 2017 to US$33.4 million in 2019.

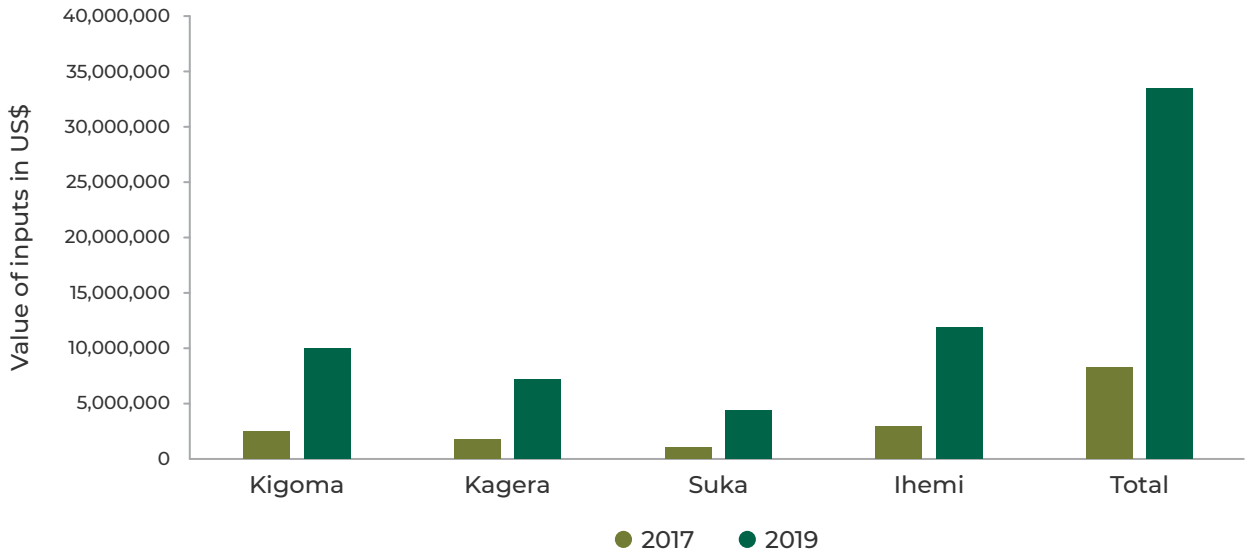


Figure 56: Increase in input sales during the consortia implementation period

Strengthening the Last-Mile Delivery System through VBAs

The partnerships built between VBAs and input supply companies are a major avenue through which the private sector contributes to extension (See Box 17). VBAs were effective intermediaries who stimulated the demand for inputs (seed, fertilizer, herbicides etc.) and acted as agents for the outputs markets (aggregation of farm produce for buyers).

The consortia model promoted inclusivity, where women and youth VBAs were given opportunities to participate and benefit at all the levels of agricultural value chains. Out of the 6,344 VBAs (2,240 female) who participated in this program, 1,903 VBAs (~30%) have graduated to become market agents for inputs and outputs companies. These VBAs also provided hire services like spraying, shelling, and planting for farmers within a 7km radius.

The VBAs' proximity to farmers reduced the cost of inputs. For example, Leah Mvula of Masigira village, Songea Rural District, was an agent of Meru Agro, a seed company. The company sold maize seeds to her at TZS4,500/kg and she sold it at TZS5,500/kg. While the prevailing market price for seed was TZS6,000/kg, Leah therefore got more customers because she sold the seeds at a more competitive price.

Box 19: VBA and agro-dealer partnerships

Mama Bwilo, a hub agro-dealer in Rukwa, worked with 30 VBAs, enabling her to expand her outlets. In Kagera, Stanford Kyabona in Nshamba Muleba worked with 24 VBAs to expand his customer base. In Kigoma, 57 hub agro-dealers increased sales by 337% (from 2,210 to 9,658.31 MT/year) as a result of working with 2,170 VBAs. Furthermore, in Njombe, Innocent Fabian Agro Chemical worked with 25 VBAs and reported a 50% increase in the sale of inputs through these relationships.

Government Buy-In

Improved policy and regulatory framework

AGRA's investment in policy and state capability work aimed to enhance the enabling policy and regulatory environment for agribusinesses, including smallholder farmers, operating in the agricultural value chains. This was done to improve the business enabling environment for agribusinesses and farmers, catalyze investments in the agricultural value chains and contribute to agricultural transformation.

To support policy reforms in the agriculture sector, AGRA adopted public-private partnerships, dialogues and engagements in both the identification of the problem and coordination and management of policy reforms. Thematic areas that were covered included agricultural inputs (particularly seeds and fertilizer), predictable cross-border trade, post-harvest management, and strengthening Tanzania's performance in the CAADP mutual accountability framework. AGRA also supported the development of TAIDF, which is a framework for coordinating and mobilizing resources for agro-industrialization in the countyr.

Key outcomes from AGRA's investment in this body of work include liberalization of access to registered public seed varieties, relaxation of regulations governing introduction and registration of customized blends of fertilizer, and lifting of export bans in 2018. Tanzania's score on the CAADP mutual accountability also improved from 3.1 in 2017/2018 to 5.08 in the 2019/2020 review period.

Improved planning and coordination

The regional secretariats in Kigoma, Kagera, and Ihemi-Ludewa have incorporated the consortia into their administrative framework for implementing agricultural development in their LGAs. This happened when the LGAs established agricultural stakeholder platforms, with the individual consortia at the centre of these platforms.

AGRA provided the resources needed to convene the initial stakeholder meetings, which served as mini agricultural working group forums, with individual consortium members serving as delegates to the platforms. These platforms were useful in fostering synergies and accountability among the actors, and avoiding duplication of investments. They convened each quarter to enable all agricultural development programs to share results and experiences. Anchoring this within government structures helped to ensure continuity beyond the funding support period.

Weaknesses and Opportunities

- AGRA's monitoring and evaluation system is a result-based and impact-driven approach for tracking and reporting on programmatic interventions, core assumptions, and measurement of outputs, outcomes, and impact to increase the organizational and program effectiveness, efficiency and sustainability. This system is supported by an efficient online data management information system that largely captures and reports on quantitative indicators. The data generated from this system is, however, insufficient to fully inform and guide decision-making.
- The AGRA MEL approach also lacks the rigor for collecting and collating learnings across the organization. The learnings are also largely unstructured and ad hoc in nature. A lot of focus is placed on frequent reporting at all levels but there is lack of clarity on what information is needed to inform decision-making.

While mechanisms exist for identifying and addressing gaps or threats to progress exist, these are constrained by lack of strong evidence, especially at outcome level, depicting changes on the lives of targeted beneficiaries. Measuring these changes has been confined to annual outcome surveys, special studies and impact stories development.

- Going forward, AGRA plans to implement comprehensive cycle of impact and higher-level outcomes evaluations, thematic deep-dive studies and macro/context data synthesis and remote sensing that will result in monthly publications for each focus country on selected key indices. Over time AGRA will build an Africa-wide central repository of information/data. All evaluations will incorporate control groups to analyze both trends and the counterfactuals on farmer changes.
- Continuous data collection and analysis will be supported by a versatile on-the-ground and virtual field phasing infrastructure built to respond to various internal and resource partners' needs. A comprehensive learning agenda will be developed around learning questions from the on-set of the strategy, augmented by predefined dissemination approaches, platforms and schedule for development and dissemination of knowledge products. The reporting will also be streamlined to be fit for purpose by capturing key information needed to support decision making.

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