Models for Strengthening Last Mile Seed Production and Distribution in Fragile Contexts

EXAMPLES FROM BURUNDI, MOZAMBIQUE, NIGER AND SOUTH SUDAN

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USAID FROM THE AMERICAN PEOPLE

SCALE
Strengthening Capacity in Agriculture Livelihoods and Environment

ISSD Africa

ABOUT SCALE

The SCALE (Strengthening Capacity in Agriculture, Livelihoods, and Environment) Award is funded by USAID's Bureau for Humanitarian Assistance (BHA) and implemented by Mercy Corps in collaboration with Save the Children. SCALE aims to enhance the impact, sustainability and scalability of BHA-funded agriculture, natural resource management, and off-farm livelihood activities in emergency and development contexts.

ABOUT ISSD AFRICA

Established in 2012, Integrated Seed Sector Development in Africa (ISSD Africa) is an international community of practice that guides seed sector innovation and development on the African continent, to improve access to quality seed.

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Refugee farmers sorting different sorghum varieties in Ajuong Thok. Photo by Lemi Joseph.

INTRODUCTION

Reaching smallholder farmers with vital inputs like quality seed – within walking distance of their homes – is an example of the wider concept of 'last mile' delivery. This refers to the final steps in a production and marketing chain – getting the product to the individual customer at the end of that chain – whether it be for telecom services, medical care, or farm inputs.

Seed as a farm input is frequently the focus of last mile interventions,[1] as farmers often have limited access to quality seed. These interventions can provide farmers with multiple benefits such as access to modern varieties that perform well even in marginal areas[2] and to higher quality seed – free of disease – that brings yield gains.[3,4] The investment returns can be substantial: a farmer sowing a kilo of sorghum seed may harvest over 100 kilograms (kgs) of food, and farmers specializing in high quality seed production often reap marked profits.

Last mile delivery for farm inputs, such as seed, tends to be complex. Seed has to remain viable all along the delivery chain, which can be especially challenging in unstable operating conditions. In fragile contexts, road structures may be poorly developed; there may be few formal sales outlets; extension services may be weakened or nonexistent; and farmers may have low buying power. These constraints can be further exacerbated by shocks and stresses such as extreme weather events (e.g., drought or cyclones) or civil war.

Making inputs available locally at the last mile requires creative approaches that systematically take into account both the context and the needs and circumstances of end users. Over the years, donors and humanitarian organizations working in fragile contexts have increased their focus on promoting improved agricultural technologies, including seeds. Seed-related initiatives in these contexts have largely focused on strengthening the formal seed sector[5] using classic centralized approaches. However, more decentralized and diverse ones may prove more flexible and effective in fragile contexts.

Against this backdrop, Integrated Seed Sector Development in Africa (ISSD Africa), through the Mercy Corps-led action learning activity *Developing the Seed Sector in Fragile States*, and the USAID Bureau for Humanitarian Assistance (BHA)-funded SCALE Award requested inspiring examples of models for strengthening last mile seed production and distribution for better seed systems resilience in fragile environments. Both SCALE and ISSD Africa wish to promote innovative approaches to seed sector development and to enhance equitable and sustainable access to quality seed of farmer-preferred varieties.

1 Nagarajan, Latha, Thomas Muesembi, & Alexander Fernando. 2019. Review of Existing Last Mile Seed Delivery Models and Approaches. A Feed the Future Global Supporting Seed Systems for Development activity (S34D) report. https://pdf.usaid.gov/pdf_docs/PA00XHC8.pdf

2 Atlin, Gary N., Jill E. Cairns, and Biswanath Das. 2017. Rapid breeding and varietal replacement are critical to adaptation of cropping systems in the developing world to climate change. Global Food Security, Volume 12, Pages 31-37, ISSN 2211-9124, https://doi.org/10.1016/j.gfs.2017.01.008.

3 Finch-Savage, W.E. and G.W. Bassel. 2016. Seed vigour and crop establishment: extending performance beyond adaptation, *Journal of Experimental Botany*, Volume 67, Issue 3, Pages 567–591, https://doi.org/10.1093/jxb/erv490

4 Sperling, Louise, Andrea Mottram, Wilfred Ouko, and Abby Love. 2022. Forthcoming. Seed Emergency Response Tool: Guidance for Practitioners. Produced by Mercy Corps and SeedSystem as a part of the ISSD Africa activity.

5 Walsh, Stephen & Sperling, Louise. 2020. Review of Practice and Possibilities for Market-led Interventions in Emergency Seed Security Response. 10.13140/RG.2.2.26610.32961.

Over 20 organizations responded to the request for case studies, demonstrating the relevance of this topic to the food security community. The proposals, from a number of regions, covered a range of interventions to increase access and use of certified, local, or high-quality seed. The number of responses made it difficult for ISSD Africa and SCALE to select which cases to appear in this final collection. The four case studies presented here were selected based on a scoring rubric completed by SCALE and ISSD Africa advisors that considered: how innovative was the approach; its potential for impact on last-mile farmers; cost/time efficiency (i.e., does it decrease time between variety release and farmer adoption); its potential for scalability; and whether it was deployed in a fragile context. They are intended to highlight lessons relevant for Africa.

Documentation on seed production and distribution tends to be slim for fragile contexts, and this set of cases aims to reduce the knowledge and lessons gap. The cases provide examples of approaches to reach smallholder farmers, highlighting: what seems to work, what might best be dropped, and how to respond to various challenges. They may need to be tailored further in other contexts, and as conditions and businesses evolve through time.

The organizers thank everyone who contributed to this effort and look forward to more opportunities to learn from each other on ways to strengthen seed production and distribution in fragile contexts.

The approaches presented do not necessarily reflect the views of USAID or the United States Government and should not be viewed as an endorsement by USAID's Bureau for Humanitarian Assistance, ISSD Africa or the SCALE Award

A local seeds storage facility in Ajuong Thok. Photo by Lemi Joseph.

HIGHLIGHTS FROM THE CASE STUDIES

Photo by Lemi Joseph

CASE 1 Local Seed Multiplication in South Sudan: Building the Resilience of Host Communities and Refugee Farmers

In collaboration with community agricultural committees and local refugee and host community farmers, the International Rescue Committee (IRC) introduced a for-profit seed multiplication scheme in South Sudan to strengthen local seed production. This case study details how IRC, through a United Nations High Commissioner for Refugees (UNHCR)-funded project, worked to strengthen the capacity of local farmers to become seed multipliers and to train other outgrowers to do the same. It also details how IRC helped establish the Farmer Economic Marketing Association (FEMA), which focuses on the production of quality seed and surplus food crops for the markets. FEMA supports farmers to improve their storage practices and facilities, and marketing and sales practices. It also facilitates market linkages, such as between farmers and agrodealers who can store and resell the quality seed that farmers produce in other locations, providing them with more income. IRC's model from South Sudan demonstrates that commercial local seed multiplication is a promising approach to ensure seed and food security and that it can be undertaken in fragile contexts. The case study lays out several lessons learned that helped make the model work, such as being demand-driven and community-based and thinking about the sustainability of the business model by working through markets.

Read more here.

Photo by IFDC

CASE 2 Boosting Local Certified Seed Production in Burundi through Private Seed Sector Development

The Private Seed Sector Development (PSSD) project (2018-2022) tackles the issue of poor quality seed in Burundi by supporting local and international seed companies and entrepreneurs. Funded by the Embassy of the Kingdom of the Netherlands in Burundi and implemented by the International Fertilizer Development Center (IFDC), PSSD works both on increasing consumer demand for certified seed, such as through micro-demonstration plots and radio broadcasts, and on increasing certified seed supply through partnering with the private sector to boost production. The PSSD project supports seed producers to develop last mile distribution capabilities through rural points of sales and mobile sales agents and builds their capacity to set up micro-demonstration plots and conduct field days in remote communities. Additionally, it supports the seed companies to increase production efficiencies through the provision of targeted technical and financial support for critical infrastructure upgrades and production intensification. This case contains an overview of the approach and testimonials from farmers, seed producers, and sales agents describing their use of locally produced, certified seed.

Read more here.

CASE 3

Seed System Resilience in Mozambique: Banking on the Green Discounts Initiative to Increase Smallholder Farmers' Access to Seed

Photo by NCBA CLUSA Mozambique

Promotion of Conservation Agriculture Project II (PROMAC II), an initiative funded by the Royal Norwegian Embassy and implemented by the National Cooperative Business Association CLUSA International (NCBA CLUSA), demonstrates how conservation agriculture (CA) can more than double the yields of crops produced through conventional agricultural practices. The case study focuses on NCBA CLUSA's work with smallholder farmers in north and central Mozambique. PROMAC II is anchored in the three principles of CA: minimum tillage and soil disturbance, permanent soil cover to reduce erosion and make crops more resilient to weather events, and the use of crop rotation and intercropping to increase soil fertility. By introducing an input subsidy scheme, the Green Discounts Initiative, PROMAC II encouraged smallholders to try the full CA package alongside improved inputs. Unlike many inputs subsidy projects, the Green Discounts Initiative works through established commercial input channels to strengthen existing market systems. By making it easier and cheaper for input firms to reach last mile consumers with a product that is suited to their means and needs, the approach builds a compelling business case for these firms. The case study goes on to show the evolution of PROMAC II's role from direct market actor to market facilitator as the local market becomes more inclusive of smallholder farmers.

Read more here.

CASE 4

A Market-Based Approach to Strengthen Local Seed Systems in Niger

Photo by Adamou Abdou Ali, CRS Niger

The Girma Project, a multisectoral development project funded by USAID's Bureau for Humanitarian Assistance (BHA) and implemented by Catholic Relief Services (CRS) Niger in the departments of Magaria and Dungass (Zinder Region), takes a market-based approach to enabling producers to buy and use certified seeds of improved varieties. To ensure high quality seed continues to be available in the intervention areas after the end of the project, Girma chose to work from the outset on establishing and strengthening the local seed production and distribution system. The project established a partnership with a local seed company, Ferme Semencière Amaté (FESA, Amaté Seed Farm), based in the neighboring region of Maradi, which wanted to expand into a new area. Each year, FESA participates in the training given by Girma and provides the inputs for seed production to partner multipliers. FESA then signs production contracts with the partners, provides inputs for seed production, buys the seeds produced, and markets them on consignment to the identified agrodealers. Girma makes the case for a system in which all stakeholders – agricultural producers, seed multipliers, agrodealers, and the seed company – benefit from a sustainable seed system. The case study outlines Girma's plans to improve upon their model in the coming year, such as increasing its use of demonstrations and other extension approaches.

Read more here.

LESSONS LEARNED

The four case studies provide useful lessons and point to intervention pathways that can better reach last mile producers. See below for lessons that are global across cases and for ones that are more case-specific, but which offer key insights for last mile approaches in similar contexts.

GLOBAL LESSONS ACROSS THE CASE STUDIES

The global lessons reflected in these cases, which take place in fragile contexts, share similarities with broader global lessons for improving last mile seed production and distribution. These include:

- **Focus on market-based approaches.** Market-based approaches to seed distribution – which take into account both demand and supply side constraints to seed access, availability and quality – are more likely to achieve project outcomes and to continue after an initiative ends. In fragile contexts, focus should include developing the enabling environment for private sector investment.[6]
- **Create partnerships between local market actors.** Creating partnerships between and with local market actors (e.g., seed suppliers and farmers' associations) contributes to the sustainability of interventions. Where operational stability is not guaranteed, as is the case in fragile contexts, such partnerships should focus on enhancing quality seed production and seed business skills for local seed producers and marketers.[7]
- **Couple seed access with social and behavior change approaches.** Access to seed alone is not sufficient. Coupling access with demonstrations or training on good agricultural practices (GAPs) (e.g. those provided by agrodealers or seed producers) has been shown to be more effective in facilitating behavior change. Knowledge gained through training on GAPs can provide farmers with an effective coping mechanism while improving risk management skills for farmers in unstable operating conditions.[8]
- **Understand farmers' seed preferences.** Understanding farmers' seed preferences is critical to matching producer and agrodealer supply with demand. In fragile contexts, where farming objectives change quickly and seed/variety supply must adapt to new preferences, it is especially important to understand preferences.

In addition to the points above, program interventions must make deliberate efforts to improve opportunities for women in seed systems for them to be successful long term. Such engagements include opportunities for women's participation in decision making around seed selection; expanding women's access to financial services; increasing their access to agricultural information; and ensuring that women might also capture emerging business opportunities.

6 SeedCLIR: Democratic Republic of the Congo. 2019. Prepared by Fintrac Inc. as part of the Feed the Future Enabling Environment for Food Security project. https://agrilinks.org/sites/default/files/resources/drc_seedclir_country_report_final.pdf

7 ISSD Uganda. 2015. Supporting Local Seed Businesses. A Training Manual for ISSD Uganda. https://edepot.wur.nl/335946.

8 Kahan, David. 2008. Managing Risk in Farming. https://www.fao.org/uploads/media/3-ManagingRiskInternLores.pdf

CASE-SPECIFIC LESSONS, WITH WIDER APPLICABILITY

The following lessons are drawn from the specific cases and may offer key insights for last mile approaches in similar contexts.

- **Engage at the local level.** Decision-making, design, and implementation need to engage the truly local level. For example, decentralize points of sale and utilize mobile sales agents to reach last mile producers and consumers. Additionally, build the capacity of seed producers to set up micro-demonstration plots and conduct field days in remote areas in order to promote their products (see Case Study 2).
- **Ensure highly-adapted varieties.** Varieties (germplasm) on offer must be locally adapted to the environment and to local preferences. Both local and modern varieties should be considered for promotion. In stressed environments, consider specific adaptation (see Case Studies 1 and 4).
- **Couple seed with other non-seed agricultural products and services.** To increase the range of services and products available to smallholder farmers, couple seed with complementary non-seed products and services. For example, bundling weather insurance with high quality seed in fluctuating weather environments, or mechanical ripping services with improved input packages for land preparation (see Case Study 3).
- **Include non-seed activities to support social cohesion.** In conflict or protracted crisis areas, especially where natural resources are strained, projects must engage in collaborative problem solving with refugee and host community farmers and other key stakeholders. Include non-seed activities that focus on building non-violent dispute resolution skills and that promote social cohesion (see Case Study 1).
- **Leverage also informal seed systems.** Links must be developed beyond the strictly formal seed sector to include the informal and integrated systems that help foster sustainable seed sector development. Linking with varied non-formal sectors helps increase access to quality seeds that shorten supply chains, strengthen the local market system, and decrease dependency on international and regional markets (see Case Study 1).

Interventions that can better reach last mile producers must strengthen both formal and informal seed market systems. This includes linking production and distribution hubs, agrodealers, and seed traders with farmers – helping build more trust between seed system actors and improving the supply of seed that meets farmer demand and preference; improving capacity of actors along the seed value chain and in the broader market system; and facilitating access to credit, where needed. At the same time, interventions such as policy lobbying can create an enabling environment for the type of seed businesses that operate in last mile regions and on a sustained basis.

Finally, developing a robust seed system requires complementing innovative models with diagnostic approaches such as seed system security assessments. In stable and fragile contexts, such assessments take into account the informal and formal seed systems and help ensure that intervention design is determined by the real seed needs and the unique challenges surrounding seed availability, access, and quality among last mile farmers.

CASE 1

Local Seed Multiplication in South Sudan: Building the Resilience of Host Communities and Refugee Farmers

CASE STUDY BY IRC SOUTH SUDAN

THE PROBLEM WE ARE TRYING TO SOLVE

The world's newest country, South Sudan, is suffering the devastating consequences of decades of civil war and renewed conflict among different groups. Community displacement is on the rise and people face climate change-induced disasters, causing significant food insecurity. Droughts, in particular, continue to drive on-going famine in the country, affecting 7.3 million people.[1]

For a refugee or displaced person, regaining one's livelihoods is a question not only of food security and income generation but also of resilience, mental health, and social cohesion. Many refugees face barriers to obtaining sufficient food. For example, World Food Programme (WFP)-supported rations only cover 70% of households' food needs, leaving a large food gap. Lack of access to arable land and inputs like seeds is also a problem. Meanwhile, host communities may feel the added burden of rapidly increased numbers of people who need to share scarce resources, like land, as both refugee and host communities pursue farming for household food and income.

In Unity State, both refugee and host community farmers struggle because there is limited seed availability, and it is often of low quality.

1 IPC – Sudan Acute Food Security Analysis, April 2021. Available at: https://reliefweb.int/report/sudan/sudan-ipc-acute-food-insecurity-analysis-april-2021-february-2022-issued-may-2021

Photo by Lemi Joseph.

About the International Rescue Committee (IRC)

The International Rescue Committee (IRC) responds to the world's worst humanitarian crises and helps people whose lives and livelihoods are shattered by conflict and disaster to survive, recover and gain control of their future. In more than 40 countries and in over 20 U.S. cities, our dedicated teams provide clean water, shelter, health care, education, and empowerment support to refugees and displaced people. In South Sudan, the IRC has been one of the largest providers of humanitarian assistance since 1989. Today IRC is assisting over 1 million people with services in the areas of health, nutrition, food security, economic development, and the protection of children and women, as well as with human rights promotion.

To learn more about IRC's model in South Sudan, contact: Benson Adoko (Benson.Adoko@rescue.org), Sadou Soumana (Sadou.Soumana@rescue.org) and Natalia Strigin (Natalia.Strigin@rescue.org).

Refugee farmers sorting different sorghum varieties in Ajuong Thok. Photo by Lemi Joseph.

A glimpse into the lives of Yahiya Ngalo and Abil Bol

Yahiya Ngalo, a 63-year-old farmer, disabled due to an arm injury, had to flee his home in the Nuba Mountains of South Sudan. Finding himself in the Pamir refugee camp with little more than the clothes he was wearing, and despite the trauma and hardship he had experienced, he was eager to restart his agricultural production to ensure sufficient food for his family during the season.

Abil Bol is a local farmer and mother in the host community of Jamjang Payam in Unity State. She has worried about her family's food security year after year, and has faced many challenges in producing sufficient food for her household.

Farmers such as Yahiya Ngalo and Abil Bol regularly face difficulties in obtaining locally adapted seeds of their preference (see box to the left for more information about these individuals.) The COVID-19 pandemic has aggravated this reality by restricting individuals' movements and the transport of goods across borders, limiting farmers' access to seeds which tend to be imported. Yahiya Ngalo and Abil Bol, as so many of their peers, were heavily reliant on imported seeds and seed aid and encountered significant supply interruptions. Delayed acquisition of seed meant missing the time window to plant, resulting in poor harvests.

Facing such limitations, refugee and host community farmers have little choice but to buy what is available in local markets. That often means buying seeds that have low germination rates due to inadequate storage throughout the supply chain and during long transport times. Unfavorable agro-ecological conditions, compounded by climate change-induced erratic weather patterns, negatively affect agricultural production. Under these conditions, the absence of high-quality seeds can be life-threatening for last mile farmers and their families. This case study demonstrates the potential of commercially-oriented, local seed production to spur demand for quality seed among last mile smallholder farmers, and to strengthen local production for a more resilient seed system.

HOW DID WE TACKLE THIS?

In speaking with affected refugee and host community members, such as Yahiya Ngalo and Abil Bol, IRC identified the potential for local seed production to cater to existing demand. Specifically, farmers were interested in seeds for groundnuts, cowpeas, sesame, and sorghum as these are staple and/or cash crops that ensure families' food security. With funding from UNHCR, in collaboration with community agricultural committees and local refugee and host community farmers, IRC introduced a for-profit seed multiplication scheme for these crops. The approach invigorated the local seed production system by building the capacity of local farmers to become seed multipliers and to train other outgrowers[2] to do the same.

Farmers in Ajuong Thok sewing bags of seeds ready for purchase. Photo by Lemi Joseph.

Yahiya Ngalo and Abil Bol were among the 27 men and 13 women of the program's target population who were identified as lead farmers based on their farming skills and adoption of best practices. They were provided with foundation seed, which was obtained from accredited input suppliers in South Sudan and abroad, to grow a number of prioritized crops on three feddans[3] (approximately three acres) per farmer during the 2019/20 season. Lead farmers were also able to access tractor-plowing services and were initially trained on land preparation, seed sowing practices, integrated crop and pest management, and postharvest handling. Subsequent modules covered quality seed selection and grading, safe storage, business planning, and marketing.

Each lead farmer worked together with a group of 25-30 outgrowers from their communities, providing technical guidance and support as needed. The outgrowers cultivated an additional 1,000 feddans of farmland provided by the agricultural committees, and, in total, 1,120 farmers participated in the project.

At the same time, IRC facilitated the establishment of the Farmer Economic Marketing Association (FEMA), a formal group of farmers focused on the production of quality seed and surplus food crops for local markets. FEMA facilitated access to improved inputs for the farmers, and supported them to improve their production practices, storage practices and facilities, and marketing and sales practices. With the support of FEMA, the lead farmers and outgrowers were able to network, make market linkages, and increase sales. The farmers connected with agrodealers who would appropriately store and resell the quality seeds through sales agreements. These agreements were a key source of income for the local seed producers, which they could reinvest in the next agricultural season.

FEMA also established linkages with agriculture unions such as the Seed Traders Association of South Sudan (STASS), which supports FEMA's capacity building program and has connections to external markets and input sources. FEMA now coordinates market engagement and collaboration with the Ministry of Agriculture on behalf of its members. It also coordinates tailored training for farmers on quality seed production and management, as well as sustainable and

2 An outgrower is a farmer who undertakes to supply seeds to a buyer or buyers at some future time in accordance with certain requirements. In return, the seed buyer or buyers agree to purchase the seed (often at a pre-agreed price) and may provide other technical support for guaranteed quality.

3 A feddan is a unit of area used in certain countries such as in Egypt, Oman, and South Sudan. 1 feddan = 0.42 hectare = 1.04 acres.

climate-adapted agricultural production with the support of STASS. FEMA covers its costs by charging a fee equal to a small percentage (1%) of the total sales made through FEMA-identified markets.

In addition to the lead farmers, outgrowers, and FEMA, the local agricultural committees are another essential partner in the success of this approach. They are responsible not only for land allocation for refugees and host communities, but also for regular safety monitoring of agricultural production, negotiation, and dispute resolution among farmers or between farmers and livestock owners. The committees also carry out advocacy with government entities, such as the Commission for Refugee Affairs, to discuss levies or inclusion of refugee and host communities in projects. These efforts have proven essential to the success of local seed production given the volatile context and continuous pressure on both host and refugee community members.

KEY FINDINGS

Based on the project evaluation findings in 2021, participating outgrower farmers reported improved levels of seed security due to improved availability and timely access to sufficient quantities of locally preferred and adapted seed varieties. Outgrowers planted in May 2020 and were able to fully harvest the groundnut, cowpea, sesame, and sorghum crops by October 2020. They then stored the seeds for six months before selling off their harvests in April 2021 to a range of buyers including traders, farmers and IRC for local seed procurement. The total production by all seed multipliers amounted to 218 metric tonnes (MT) across all targeted crops in 2020 because of improved agricultural practices and higher quality inputs. Overall, compared to the 2018 baseline, participating farmers recorded 33% average yield increase between 2018 and 2019 and 59% average yield increase between 2018 and 2020 harvests of crops such as sorghum, cowpeas and sesame.

All participating farmers reported being able to meet their food gaps during the lean season and 62% of female farmers reported an increase in daily family food consumption. Access to locally adapted seeds increased among refugees and host communities by 70% and 87%, respectively.

In 2019, Yahiya's 10 feddans produced 2.1 MT (1.3 MT of sorghum and 0.8 MT of sesame) which only enabled him to meet food needs with minimal surplus to sell. In 2020, he focused on seed multiplication of sesame, groundnuts, and cowpeas and planted about 10.5 feddans. The slightly larger production site and the improvements in seed quality and agricultural practices enabled him to produced 3.3 MT of seed. He sold some of the seed, worth USD 1,700, and used the money to expand his agricultural production to meet his family's basic needs.

In Ajuong Thok market, the number of produce dealers rose by 30% with buyers coming from within the State and from neighboring States. These trade interactions further improved cohesion between host and refugee communities, with 77% reporting 'bridging social capital' improvements.

IRC's local procurement of seed also increased from 80% in 2019 to 100% in 2020. Of the seed multipliers' total yield, IRC procured 85 MT (approximately 40% of total production) of cereal seed directly from the seed producers worth USD 106,641. As part of IRC's food security and agricultural development programming, these locally adapted and procured seeds were redistributed to an additional 11,000 vulnerable or poor farmers (of which 7,700 were women), which represents about 10% of the local refugee and host communities. The aim of this intervention was to promote locally produced seeds among a larger group of farmers in the area to demonstrate their options in terms of supply.

Local seed procurement reduced IRC's cost to provide access to preferred, high-quality, local seed varieties to refugee and host communities.

IRC supported farmers transported local seeds to seed collection and sales points. Photo by Lemi Joseph.

The outgrower farmers were able to either store or sell the remainder of the seed to other traders or farmers. The increase in crop yields meant that households such as the families of Yahiya and Abil could improve their access to food, meet their 30% food ration gap, and generate income from surplus production. Additionally, the increase in farming livelihoods enabled program participants from Year 1 to purchase their own seeds by Year 2, demonstrating the increase in market demand and local purchasing power. Program activities to establish new links between seed producers, farmers, and local and external agrodealer unions contribute to the sustainability of the intervention as seed producers develop additional opportunities for future sales and markets for their seeds.

Overall, the key benefits of the IRC approach included: increased access to locally viable and preferred seeds for farmers, which increased acreage and yields; reduced cost of input provisions (i.e., lower transportation costs for local versus imported seeds) for farmers and IRC; additional income for seed producers; and enhanced food security. Farmers have expressed satisfaction with the approach – a farmer-led model where seed producers select locally acceptable and adapted seed varieties and specialize in the multiplication for sales in local markets.

WHAT MAKES OUR MODEL WORK?

IRC's model in South Sudan demonstrates that commercial local seed multiplication is a promising approach to support seed and food security and that it can be undertaken in fragile contexts. For this model to succeed, there are key elements to consider:

- **Demand-driven:** Locally adapted and preferred seeds are essential for sales and farmer uptake. Farmers working with the project are now catering to local demand and offering a better product in a timelier manner than before. This not only benefits farmers but also aid agencies, government, and private sector stakeholders, who now have better access to quality seeds that shorten supply chains, strengthen the local market system, and decrease dependency on international and regional markets.
- **Community-based:** In fragile contexts, governance structures may be limited in their service delivery or legal enforcement role. In this context, establishing community buy-in through, for example, community agricultural committees is a way for refugee and host community farmers, especially the most vulnerable, to access land. To ensure social cohesion–which is key in protracted or post-conflict contexts that are still fragile and have strained natural resources–projects need to systematically engage in collaborative problem solving with refugee and host community farmers and other key stakeholders. Including activities beyond seed production and sales, such as strengthening nonviolent dispute resolution skills, organizational management, and safety and well-being of marginalized groups, is important as well.
- **Market-driven business model:** Seed multiplication needs to be based on existing demand and on a solid market assessment. This should be undertaken together with farmers to identify shortcomings and opportunities and to determine solutions. For example, prior to the pilot, IRC engaged farmers to identify

challenges hindering access to prioritized seed types and to discuss opportunities for developing a local seed system. It is key to envision support activities within the wider market system and think about how stakeholders will take up or improve functions within this system. To ensure financial sustainability, there should be a strong focus on building market linkages to complement seed production activities. FEMA took on this role by establishing market linkages with agricultural unions, such as the Seed Traders Association of South Sudan (STASS), traders in other regions of South Sudan, and other farmers' associations. These efforts not only facilitated access to quality seeds in areas where farmers otherwise struggle with seed access but also opened doors to potential future business expansion for the seed producers.

WHAT IS NEXT?

IRC is working on several fronts to improve upon the project results. The farmers already involved in the project are planning to expand to other in-demand seed varieties and agrodealers want to buy from farmers and expand sales to other markets. IRC has facilitated the creation of a Farmer Marketing Network with the support of the County Agriculture Director, lead/seed farmers, and the Commission of Refugee Affairs. This network, trained in seed quality assurance, fosters the production of quality seeds through a community-led seed quality assurance board that monitors seed producers' activities throughout the season. Seed producers who meet the minimum requirements developed by the board can be certified at the county level.

Additionally, IRC will continue to build FEMA's capacity to manage collective seed production and marketing initiatives, and advocate for more government/NGO support for tractor services, increased acreage, more land access, and better security. Through STASS, networks will be built to support FEMA certification at the national level, thereby positioning it for opportunities to receive seed multiplication contracts and to be able to supply other agencies such as the World Food Programme (WFP), the UN Food and Agriculture Organization, and the State Ministry of Agriculture. Additionally, FEMA is exploring partnerships to continue training and contracts with seed producers beyond the IRC project.

IRC plans to provide seed grants to producers and lead farmers and to strengthen market linkages to external buyers through FEMA. It is also working with FEMA's marketing committees to negotiate with private sector players, such as STASS, and with other groups such as WFP, to procure seeds. IRC, with support from the United Nations Refugee Agency (UNHCR), is planning to construct at least two community seed bulking stores to package and market seed materials. Once created, seed producers could then use the centers to produce and brand their seed materials.

Beyond seed production, interventions need to focus increasingly on gender-transformative approaches and opportunities to sustain biodiversity. Women, who make up 70% of the farming community, play a vital role in advancing agricultural development and food security. They have a traditional role as the household 'seed security' guardian, especially for grain, legumes, and cereals, saving their own seeds each season. Yet women face serious obstacles imposed through harmful norms, traditions, and laws when it comes to land ownership; access to credit, extension and other services; and ability to hire labor. IRC will continue to promote women's inclusion through supporting them to become lead farmers and through grants (i.e., a mix of support and cash) to increase food consumption. Additional important focus areas for seed-related interventions include strengthening women's participation in decision-making; expanding their economic and social networks; increasing their access to information; and strengthening their knowledge and abilities to maintain biodiversity.

CASE 2

Boosting Local Certified Seed Production in Burundi through Private Seed Sector Development

CASE STUDY BY IFDC BURUNDI

Netherlands

IFDC
Developing Agriculture from the Ground Up

THE PROBLEM WE ARE TRYING TO SOLVE

Burundi is a strongly agrarian and densely populated country, with 257 people per square kilometer. Rapid population growth has resulted in a decrease in average land holdings from 1.04 hectares to 0.5 hectares per household between 1973 and 2009.[1] Additionally, agricultural production is low compared with other countries of the region.[2] A key cause is the lack of access to quality seed, with only an estimated 3.4% of the national seed requirement being met through certified seed. The opportunity cost per farm household, in terms of foregone revenue from not planting quality certified seed, is significant.

1 International Monetary Fund. 2012. Burundi: Poverty Reduction Strategy Paper II. IMF Country Report No. 12/224. Washington, DC. Available at: https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Burundi-Poverty-Reduction-Strategy-Paper-II-26155

2 Collins, Christy; Magnani, Rich; and Ngomirakiza, Evelyn. 2013. USAID Office of Food for Peace Food Security Country Framework for Burundi (FY 2014–FY 2019). Washington, D.C.: FHI 360/FANTA. Available at: https://www.fantaproject.org/sites/default/files/resources/FSCF-Burundi-2013-web.pdf

Photo by Egide Nduwayezu, IFDC, Burundi.

About the International Fertilizer Development Center (IFDC) and the PSSD Project

The International Fertilizer Development Center (IFDC) is an independent nonprofit organization that combines innovative research, market systems development, and strategic partnerships to spread sustainable agricultural solutions for improved soil health, food security, and livelihoods around the world. IFDC partners with allies such as international research institutions, government and nongovernment agencies, and the private sector to advance, improve and promote food and nutrition security, agricultural sustainability, economic development, and environmental protection.

IFDC's Private Seed Sector Development (PSSD) project (2018-2022) is funded by the Embassy of the Kingdom of the Netherlands in Burundi and aims to double production and income of 178,000 farm households in Burundi by ensuring sustainable access to high-quality seed and agricultural advisory services.

To learn more about PSSD's model in Burundi, contact Dr. Anne Turner (aturner@ifdc.org) and/or Mr. Egide Nduwayezu (enduwayezu@ifdc.org), visit their website, or watch a video describing their approach.

Larissa Kaneza, a seed entrepreneur working with PSSD. Photo by IFDC.

Joseline Butoyi is a farmer from Rwibaga-Mujejuru Hill in Bujumbura Province, Burundi. Like many farmers in her village, she struggled to increase her potato yield. Planted on less than a quarter of an acre (0.1 hectares), the seeds did not germinate well, the potatoes were susceptible to disease, and her crop often failed to thrive. The seeds Butoyi purchased were from the local market and were not certified.

In 2018, Burundi's seed sector was in an early stage of development and poor quality seed was commonly planted by farmers. There were only seven accredited seed inspectors for the entire country, and they faced many challenges in collecting seed samples and inspecting seed fields. In addition, some international nongovernmental organizations (INGOs) were providing seed to households for free. This was a disincentive for farmers to pay for seed, making it a challenge to develop the private seed sector.

At the same time, the absence of a robust formal seed system meant that all maize seed was imported from neighboring Uganda, Kenya, and Zambia. Moreover, ineffective quality control in the formal seed system resulted in the supply of diseased planting material, especially for Irish potato tubers, with the consequence of low yields. Many farmers were

> **"Previously I grew non-certified potato seed with poor yields at harvest time. I thought all seed was productive at the same level, and I found certified seed to be expensive. So, I thought it was unnecessary."**
>
> **– MRS. BUTOYI**

either not aware of the existence of better quality, certified seeds or did not have access to them. When available, farmers had to travel long distances and pay more to obtain them.

Against this backdrop, the International Fertilizer Development Center (IFDC) launched the Private Seed Sector Development (PSSD) project to address the issue of poor-quality seed. Through testimonials from farmers, seed producers, and sales agents, this case study provides a glimpse into PSSD's approach to increasing access to and use of locally produced, certified seeds.

A mobile seed sales agent on his bicycle. Photo by IFDC.

HOW DID WE TACKLE THIS?

The PSSD project supports local and international seed companies and entrepreneurs to increase certified seed supply and clearly demonstrate to smallholder farmers the value of using certified seed. It works with these actors to boost certified seed production and to develop sales and distribution models tailored to smallholder farmers, including consumer education through micro-demonstration plots and radio broadcasts.

In order to increase farmers' awareness of and access to certified seed, PSSD builds the capacity of seed producers to set up micro-demonstration plots and conduct field days in remote villages. The locations of the micro-demonstration plots allows mobility-constrained farmers easy physical access to the plots in order to see and learn more about the certified seeds. The field days allow farmers an opportunity to learn about good agricultural practices (GAPs) and ask questions about the certified seeds.

Additionally, the project works with seed producers to develop their last mile distribution capabilities through rural points of sales and mobile sales agents. With the support of PSSD, seed producers have set up seed outlets in remote villages and are selling their quality certified seeds in micro-packs that are labeled with a certification mark. The mobile sales agents, employed by the seed producers, travel to various villages to sell the micro-packs and answer questions from farmers about the certified seeds.

> **[The demonstration plots] were really good fields compared to my own field. So, after being convinced, I went to the same contractor and bought 50 kg of certified [potato] seed. I sowed the seed and, surprisingly, the quantity harvested was far superior to what I had harvested before. Since that day, I use only certified seed that I buy from the seed contractors.**
>
> **– MRS. BUTOYI**

The project also works with seed producers on their marketing campaigns, including product branding to build trust between seed producers and consumers and developing specialized promotional materials for farmers. As part of their campaigns, seed producers promote their seed and shop locations through local radio stations.

The project has also provided targeted technical and financial support to the seed companies for critical infrastructure upgrades and production intensification, increasing production efficiencies. PSSD further supports the development of a business enabling environment to ensure that private sector actors can continue to autonomously develop and make available transformative products and services for Burundian farmers. It has operationalized the so-called Dutch Diamond approach[3] by leveraging the expertise and networks of partners in the public, private, and research sectors to strengthen seed certification procedures. For example, PSSD's partnership with the public sector (i.e., with the Institut de Recherche Agronomique du Burundi [ISABU] and the Office Nationale de Contrôle et de Certifications des Semences [ONCCS]) has enabled the introduction of new varieties in Burundi. Adaptability tests were conducted jointly by the two institutions to accelerate the release of new varieties. In 2021, 23 varieties were released, including 14 fortified organic bean varieties, five hybrid maize varieties and four fortified organic composite maize varieties.

KEY FINDINGS

The PSSD project has been operating for five harvest seasons. Between 2019 and 2020, it supported 57 seed companies and entrepreneurs to sell 1,779 tons of certified seed to 107,312 farmers, of which 43% were women. In 2021, the project was scaled up to assist private sector entrepreneurs to produce seed in 16 out of 18 provinces in Burundi and signed strategic partnerships with private sector actors to ensure that seed was available for sale in all 18 provinces. During this time, the project partnered with seed producers to install 9,931 micro-demonstration fields and trained 93,613 farmers (of which 45%, or 42,211, were women) in GAPs.

PSSD conducted a survey with farmers in its implementation area to learn the most successful methods at increasing: a) farmer awareness of the availability and benefits of certified seed, and b) access to certified seed.

Farmers reported that their *awareness of the availability and benefits* of certified seed was improved through micro-demonstration plots (75% of respondents in a survey), certified seed promotion by mobile sales agents (59%), and certified seed promotion via smallholder adapted communication channels such as community radio broadcasts (20%).

Farmers reported that access to certified seed was most improved by the micro-demonstration plots (81% of respondents), proximity to rural points of sale (52%), sales agents (22%), and micro-packages (7%).

> **I sold more than 500 kg of seed potato, and I had a great profit. I have been recognized in my community, and I plan to expand my customer base and my seed business in the future.**
>
> **– BLAISE MANIRAKIZA, NIYUSURE**
> ***Seed sales agent***

3 The Dutch Diamond approach "recognizes the value addition of government, the private sector, civil society and knowledge institutions working in partnership to realize development results. Within the Dutch Diamond Approach, the competences of partners are combined and the various goals, funds, risks and responsibilities are pooled together. The corporate efficiency and market-oriented methods of the private sector are linked with the local knowledge of civil society organizations (CSOs). Knowledge institutions contribute their expertise, while governments act as brokers and co-financers." OECD. 2016. Peer Learning Country Report, Netherlands. Available at: https://www.oecd.org/dac/peer-reviews/Peer-Learning-Country-Report-Netherlands.pdf.

Micro-demonstration plots increased access to seeds and sales by showcasing the value of certified seed and allowing farmers to learn about GAPs.

Anecdotally, farmers noted a number of benefits from using certified seed of improved varieties. These include increased profitability, yield production even in adverse growing conditions, pest and disease tolerance, and better marketability with higher prices for crops. As one farmer stated, "For the first time in my life I was able to produce three big bags (about 300 kg) of beans using 50 kg of Musole (bean) seed. I gave some to my family and sold the rest. I also learned that this variety is biofortified, which could help my wife who suffers from anemia."

Farmers are not the only ones who benefit from a viable and vibrant seed industry that provides access to certified seeds. To date, PSSD partner seed companies and entrepreneurs have employed 564 permanent job and 23,239 temporary employees.

Niyusure, the seed contractor who sold the certified potato seed to Butoyi, has seen the positive impact that certified seed production can have in a community and stated, "The seed multiplication activity allowed me to understand the seed sector, to form a relationship with financial partners and technical institutions. I have created a multiplication center for potato, bean, and maize seeds. I have also created jobs, especially for women and young people. The money they earn allows them to meet their needs, such as food, clothing, schooling for children, and to purchase certified seed."

> **Being convinced by the demonstration plots and the extension agronomists, I bought the potato seeds of the Ndinamagara variety from the seed contractor and sowed them using good agricultural practices.**
>
> **– REPORTED A FARMER FROM THE COMMUNE OF MUGONGOMANGA**

Hybrid corn seed fields in Karusi. Photo by IFDC.

WHAT MAKES OUR MODEL WORK?

The micro-demonstration plots were installed close to farming communities, enabling smallholder farmers to easily access the plots and hear about certified seeds and GAPs. Having local seed producers establish the demonstration plots, rather than INGOs, has increased trust between farmers and seed producers and decreased the cost of farmer training to between USD 5 and USD 9.50 per farmer. Nkeshimana Nestor, a sales agent for a hybrid maize seed company, noticed an increase in sales over the course of a year due to micro-demonstration plot visits. "The sale of [certified] hybrid maize seed from our company has increased from 1,250 kg in 2019 to 5,000 kg in 2020, thanks to sensitization through micro-demonstration plots and visits (…). At first, we were afraid, but with this marketing we have sold all the seeds we expected."

Maize seed producer's agronomist applying pesticide to prevent attacks on the seed crop by Fall Army Worm. Photo by Egide Nduwayezu, IFDC, Burundi

Farmer field days, critical for enabling farmers to learn and ask questions about the seeds, were organized at times of the day when farmers, women in particular, were most likely to be available. An employee of a Burundian NGO noted, "Thanks to the activity during the field days, the surrounding population of the activity area is starting to practice the new farming methods and buy certified seed from seed entrepreneurs."

Another factor contributing to the model's success is the rural points of sale and mobile sales agents. The project supported local and international seed entrepreneurs and companies to install 225 rural points of sale near rural communities, allowing farmers easier access to certified seeds and the ability to ask questions about their use.

WHAT IS NEXT?

The PSSD project will continue to support seed entrepreneurs and companies to grow sales and revenue by expanding to new regions of Burundi. The project will also refine and explore additional technologies and agricultural practices for presentation at farmer field days and demonstration plots. Most importantly, PSSD will continue to support seed producers with demonstration activities, marketing, and bookkeeping – to build the business skills they will need once the project ends.

The project is working on several other aspects of the seed sector in Burundi, including regulating seed certification, supporting new seed enterprises, and strengthening linkages between research and seed producers, sales agents, and farmers. The project recently convened seed inspectors and government representatives to create a more efficient certification system, shortening the time needed for certification. PSSD will continue such efforts to promote an enabling environment for seed system functioning in Burundi.

CASE 3

Seed System Resilience in Mozambique: Banking on the Green Discounts Initiative to Increase Smallholder Farmers' Access to Seed

CASE STUDY BY
NCBA CLUSA
MOZAMBIQUE

EMBAIXADA DA NORUEGA

NCBA CLUSA

PROMAC

THE PROBLEM WE ARE TRYING TO SOLVE

Smallholder farmers in central and northern Mozambique suffer from the highest levels of poverty, the lowest agricultural productivity, and the highest rates of malnutrition in the country. The national poverty rate is in the range of 41–46%, with nearly half of all households experiencing periodic hunger each year.[1] The agricultural sector is dominated by smallholder farmers with landholdings of less than 1.5 hectares (ha). With fewer than 6% receiving extension services, only 10% using certified seed, and approximately 6% using fertilizer in the central and northern provinces, crop productivity is low.[2] For smallholders living on the margins, it is challenging to withstand shocks and stresses and overcome crises.

1 Tschirley et al, MSU Analysis to guide USAID/Mozambique Programmatic Investments in Agriculture and Food Security, December 2020. Available at: https://pdf.usaid.gov/pdf_docs/PA00XGR1.pdf

2 Inquerito Agricola Integrado (IAI, or National Smallholder Survey) 2020 (Government of Mozambique Ministry of Agriculture and Rural Development - MADER)

Photo by NCBA CLUSA, Mozambique.

About the National Cooperative Business Association CLUSA International (NCBA CLUSA)

The National Cooperative Business Association CLUSA International (NCBA CLUSA) has been active in Mozambique since 1995. It began its work at a time when the country's infrastructure was devastated by 17 years of civil war and one of smallholder farmers' main challenges was access to markets. NCBA CLUSA's activities focus on increasing smallholder farmers' access to input and output markets.

In support of seed systems resilience and improved food security, NCBA CLUSA seeks to promote farmers' and rural entrepreneurs' production, incomes, and livelihoods through sustainable, market driven, and local seed system-based interventions. Over the past 26 years, NCBA CLUSA has managed projects in all northern and central provinces: Cabo Delgado, Nampula, Niassa, Manica, Zambézia, Tete and Sofala. The work has been funded by the United States Agency for International Development (USAID), the Government of Mozambique, the International Fund for Agricultural Development (IFAD), the Bill and Melinda Gates Foundation, the Norwegian Embassy in Maputo, and others.

To learn more about NCBA CLUSA's model in Mozambique, contact Pippy de Vletter, pvletter@ncbaclusa.net.

The farmer on the left is a Green Discount recipient, Agostinho Benzero, from Chua community Manica district, Manica Province. Photo by NCBA CLUSA Mozambique.

Additionally, Mozambique was recently classified as the most vulnerable country in the world to climate change.[3] Climate change-induced weather crises are the most sudden, dramatic, and devastating for communities, and Mozambique has suffered the effects of five cyclones and two tropical storms since 2019, with cyclone frequency and intensity clearly increasing in recent decades.[4] Data shows that, even in years without cyclones, rains have become more erratic.[5] Communities urgently require climate-resilient production methods that will enable them to withstand climate shocks and provide enough food from one harvest to the next.

HOW DID WE TACKLE THIS?

NCBA CLUSA's PROMAC II program in Mozambique focuses on increasing smallholder farmers' access to seeds through the promotion of decentralized seed production and investment in market-driven seed interventions. This is embedded in NCBA CLUSA's extension approach, through which they promote the adoption of the three principles of conservation agriculture (CA):

- minimum tillage and soil disturbance, either through manual techniques (the construction of permanent basins) or mechanical ones (mechanical ripping as an alternative to traditional plowing)
- permanent soil cover to reduce erosion and make crops more resilient to weather events, and
- the use of crop rotation and intercropping to increase soil fertility.

3 Global Climate Risk Index | Germanwatch e.V.

4 Fion de Vletter (2022) forthcoming

5 Global Climate Risk Index | Germanwatch e.V.

Through a network of demonstration plots managed by lead farmers, NCBA CLUSA's Promotion of Conservation Agriculture Project II (PROMAC II), funded by the Royal Norwegian Embassy, has demonstrated that CA can more than double the yields obtained from crops grown with conventional agricultural practices. Inspired by what they have seen over eight years of the two PROMAC programs (PROMAC I and II, together spanning from 2013 to 2021), over 33,400 smallholder farmers adopted conservation agriculture, representing a 75% adoption rate.

Conservation agriculture's potential to increase yields is maximized only when the three CA principles are accompanied by an appropriate suite of inputs, including good quality seeds of locally adapted varieties. Yet, this is difficult in a nascent and under-resourced market where smallholder farmers have limited means and access to inputs. To reduce the risk of trying the full CA package, in 2018 PROMAC II introduced an input subsidy scheme for smallholder farmers called the Green Discounts Initiative.

Lead Farmer Carlitos Chimbui from Vengo community, Manica district in Manica province, weighing his 2021 maize harvest. After adopting conservation agriculture and using Package B with hybrid maize Namuli variety, Carlitos more than doubled his yield on his ¼ hectare plot. Photo by NCBA CLUSA Mozambique.

Green Discount participants are selected in collaboration with communities and other stakeholders, such as district government and local leaders, at the start of each agricultural campaign.[6] Participants are issued an input discount card that allows them to obtain discount input packages from a participating NCBA CLUSA-supported agrodealer.

The Initiative uses existing commercial distribution channels via a hub-and-spoke model: urban input wholesalers – the hubs – who purchase inputs from input companies, and rural agrodealers – the spokes – who earn a commission of 10% of sales.[7] PROMAC II links inputs actors to each other (hubs to commercial seed and input firms, agrodealers to hubs, and smallholder farmers to agrodealers) and provides intensive training, technical assistance, and mentorship to each. Agrodealers, for instance, receive initial training on topics such as financial management, marketing and establishing demonstration plots[8] in a group, followed by an annual refresher session and approximately monthly visits and technical coaching from NCBA CLUSA's agribusiness advisors. The program advisors work with each entrepreneur to establish a mutually agreed upon work plan, which helps monitor progress. Offering training and mentoring to this group reduces their risk to enter the market and to include smallholder farmers in their business models.

6 Participants are selected based on their farm size; distance to an agrodealer; how they are preparing their land; and which crops they grow.

7 This model is based on NCBA CLUSA's model of last mile service providers used in our Yaajeende and Zambia Production, Finance and Technology (PROFIT) programs in Senegal and Zambia respectively.

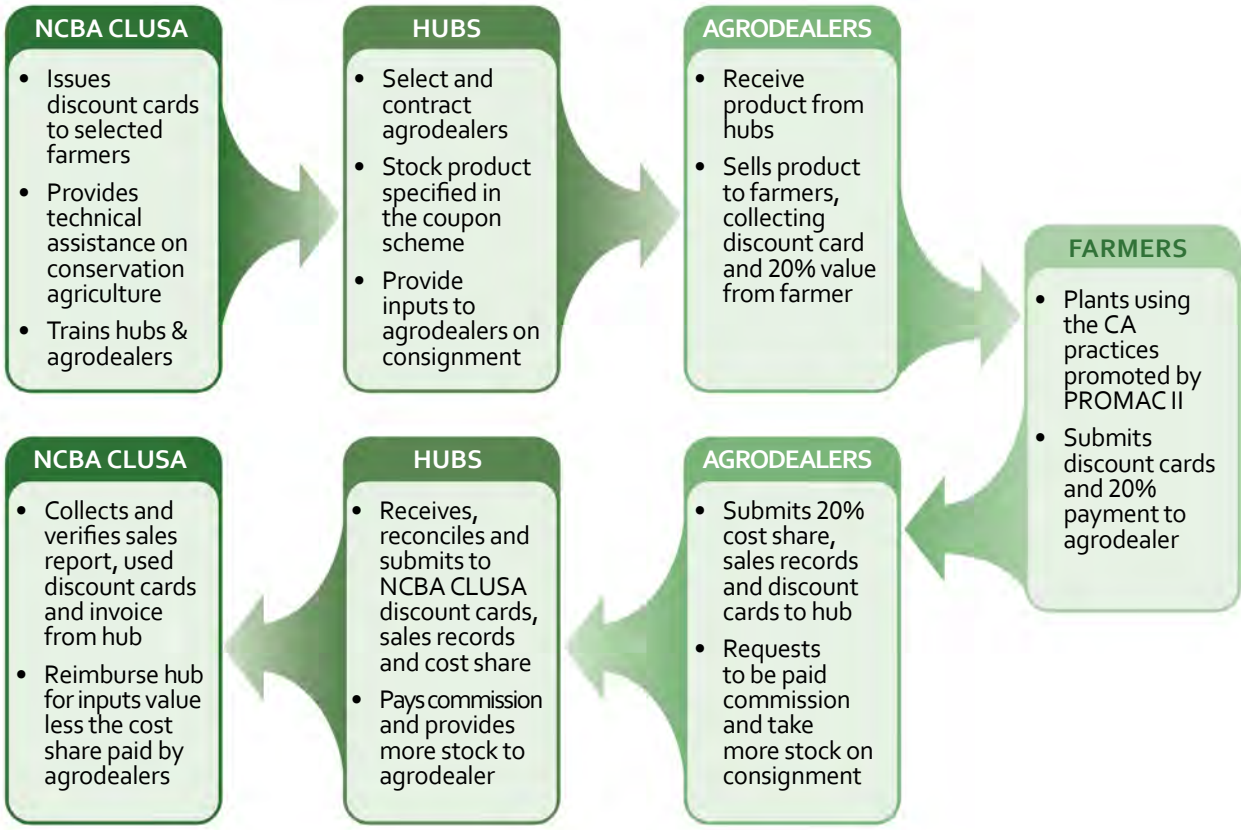
8 Full training includes the following: technical knowledge of agricultural inputs (including good agricultural practices [GAPs] and safe handling/storage), financial management/control, stock control, store layout and display, marketing (including digital marketing) and public relations, establishing demonstration plots, attending clients, business plan development, and accessing/managing external finance.

Green Discount input packages include certified seeds of maize, soya, sugar bean, cowpea, and sesame; fertilizers; herbicide; and pesticide. The packages come in two sizes, A and B, with prices more or less harmonized across different agrodealers (the small difference in cost is due to the fact that each hub practices its own commercial pricing strategy). On average, Package A, which is designed for medium-sized farmers working 1 ha of land using the PROMAC II supported ripper service, costs 24,800 MZN (around USD 380), pre-subsidy. Package B, which is aimed at smaller-scale farmers who use a manual CA technique (known as permanent basins) for improving soil fertility and water retention, costs 6,700 MZN (around USD 100), pre-subsidy.

PROMAC II bundles the ripper service with Package A to increase the range of services available to smallholder farmers and to encourage small, local service providers (ripper providers) to engage with larger input companies and enter the formal economy. Given that ripping is a new technology for smallholder farmers in Mozambique, PROMAC II works to stimulate supply and demand for the services. It loans the equipment free of charge to service providers – provided they offer ripping services to PROMAC II supported farmers in their communities – and trains them on ripping service provision, equipment maintenance and repair, business skills, marketing, and more.

The input packages have been subsidized by PROMAC II to reduce the risk for farmers who want to try CA alongside improved inputs. The subsidy started at 80% of the package's retail value during the first three growing seasons of the Green Discounts Initiative and has since tapered down to 50% as farmer demand and willingness to pay has increased. More details on the subsidy and its effects are found below in What Makes Our Model Work.

FIGURE 1: VOUCHER PROCESS (YEAR 1 WITH FARMERS CONTRIBUTING 20%)



PROMAC II stimulates demand for the input packages through demonstrations and promotional events. This includes establishing demonstration plots at the district level; supporting PROMAC II Lead Farmers to demonstrate CA practices in their communities – by establishing their own, smaller demonstration plots in years one to three of PROMAC II or by using CA on their own fields in years four and five of the program, and managing field days at these sites; and by beneficiaries (agrodealers, ripper service providers, etc.) participating in other promotional events such as fairs and expositions. There are usually three field days at each demonstration plot per year, timed to coincide with different phases in the agricultural calendar, held for smallholder farmers, local agribusinesses and entrepreneurs, inputs firms, government and other NGOs.

In 2020, through its Smallholder Effective Extension Driven Success+ project (SEEDS+), in partnership with Phoenix Seeds, Hollard Seguros, and USAID Feed the Future, NCBA CLUSA introduced the first fully commercial weather index insurance product for the smallholder market in Mozambique. The added insurance allows any farmer using seeds from Phoenix Seeds (a local commercial firm) who suffers crop losses due to drought or excessive rainfall to claim replacement seed from their agrodealer for the next campaign. SEEDS+ provided support to Phoenix Seeds to enable the firm to include weather index insurance in all of its products, at no extra cost to the consumer (i.e., by absorbing the premium cost in its profit margins). Bundling the insurance service into the price of the package has proved a successful way to increase the range of products and services available to smallholders. Free weather index insurance has become a standard element of all Phoenix products, post-SEEDS+ support.

Some of Phoenix's agrodealer network for Manica and Zambézia provinces, established with support from NCBA CLUSA via the USAID funded SEEDS and SEEDS+ programs, and consolidated and maintained through the PROMAC II. Many of these Phoenix agrodealers are also participating Green Discounts agrodealers and hubs, and the Green Discounts initiative has enabled them to access credit lines with Phoenix, sell increased volumes of inputs, and deepen their relationships with smaller input retailers and smallholder farmers. Photo by NCBA CLUSA Mozambique.

KEY FINDINGS

From January 2018 to April 2021, over three agricultural campaigns covering the six agricultural seasons, the Green Discounts Initiative benefited farmers, agrodealers and hubs in the following ways:

Benefits to farmers

- 2,350 farmers accessed inputs packages via the Green Discounts
- Those farmers accessed 37 metric tons of seed and 298 tons of other yield-enhancing inputs such as nitrogen-phosphorus-potassium (NPK), urea, and herbicides
- 484 of farmers accessed 7,910 kg of seed that was weather index insured
- In total, farmers produced approximately 2,100 tons of commodities on over 900 hectares of land (representing yields of approximately 2.3 tons per hectare). Prior to using CA technologies and inputs, they produced approximately 1,000 tons on the same area (a little more than one ton per hectare). In other words, the Green Discounts have enabled farmers to increase the area of land on which they practice CA, and to more than double their average yields
- Around 1,700 tons (81%) were kept for food security. The remaining 430 tons were sold, to the value of over $172,000 (around $70 in sales revenue per family)

Benefits to agrodealers

- Total agrodealer commissions amounted to MZN 2.6 million (over USD 41,000). Each agrodealer earned around MZN 62,000 (nearly USD 1,000) in commissions per year.

Benefits to hubs

- Total retail value of input sales (pre-subsidy) was over MZN 26 million (approximately USD 418,000)

Benefits to other value chain actors – rippers

- 19 rippers prepared 501 hectares of land using minimum tillage mechanical land preparation

WHAT MAKES OUR MODEL WORK?

The Green Discounts work through established commercial input channels and strengthens existing market systems. By making it easier and cheaper for input firms to reach last mile consumers with a product that is suited to farmers' means and needs, the approach builds a compelling business case for input firms. The initiative reduced the risk faced by seed companies to engage with hubs, and in turn for hubs to engage with small agrodealers. For instance, the Green Discounts increased the business capacities of last mile agrodealers who previously had yet to link with any hub. They now form part a hub's business model and, as such, are able to access inputs on credit, marketing support and other support services. Additionally, Green Discount participating hubs have deepened their relationships with inputs firms, allowing them to more easily access larger volumes of inputs

Antonio Guarai, Lead Farmer from Garuzo Community, Manica province, harvesting his maize. After adopting conservation agriculture and using Package B – 10kg of hybrid maize Namuli variety seed, 50kg of NPK and 50kg of urea – Mr. Guarai harvested four times as much soya on this ¼ hectare plot. Photo by NCBA CLUSA Mozambique.

Green Discounts farmer demonstrating use of permanent basins – a manual technique for conservation agriculture appropriate land preparation which retains soil moisture and fertility. Photo by NCBA CLUSA Mozambique.

on credit. The initiative also increased farmers' engagement with input markets - for some PROMAC II farmers who purchased the smaller Package B, this was the first time that they had purchased inputs and connected with a commercial inputs retailer. They have now established a relationship with their local agrodealer that should continue beyond the life of the Green Discounts.

PROMAC II has provided targeted, short-term, partial subsidies for the packages. Farmers have been willing to contribute more as the subsidy is reduced, which is a promising trend towards farmers' willingness to pay after the project ends. Pairing the subsidized inputs with ongoing technical assistance through the agricultural season and training has allowed farmers to see the potential benefits, which is PROMAC II's strategy for facilitating longer-term behavior change. The demand can be further sustained by offering additional value to the products, as the Green Discounts initiative did, by including ripper services and weather index insurance in the packages.

PROMAC II's role as part of the Green Discounts initiative has changed over the past three agricultural campaigns. Due to undeveloped input markets in the target provinces, early in the initiative, PROMAC II acted as a direct market player. For example, in some cases it assisted with transporting inputs from hubs to agrodealers and subsidized rippers' transport to more remote farms. However, the market has since become more robust as the various players – hubs, last mile agrodealers, and ripper service providers – have improved their service offerings and become embedded in the business plans of other market actors. As the market matured, PROMAC II has moved to a market facilitation role, focusing on stimulating the commercial demand for inputs and ripping services; stimulating linkages between market actors, including linking them to support services such as transport providers; and training market actors. These actors have now taken on direct market roles themselves (e.g., agrodealers engage local transporters to collect product from hubs). Trust has also increased between them and, subsequently, more inclusive business models have emerged (e.g., credit and consignment terms for hubs, agrodealers and farmers alike).

The Green Discounts Initiative is the only inputs voucher initiative in Mozambique to bundle other support services – technical assistance, ripping and insurance – with inputs packages. Field staff provide farmers with technical support, training and mentoring on farmers' own fields to ensure the correct application of inputs and ripping services for maximum impact. Crop monitoring is complemented by PROMAC II managed drones, operated by local entrepreneurs, which can detect crop stress three weeks earlier than the human eye. The technical support and crop monitoring differentiates the Green Discounts from other similar initiatives (e.g., farmer field school-based approaches) which reach farmers via a central demonstration site but do not go as far as farmers' own fields. Complemented by radio programs, videos, and SMS-based extension messages, these services have been especially important during the COVID-19 pandemic when face-to-face interaction is limited.

PROMAC II farmers from Zambézia province who have benefited from Green Discounts packages including the mechanical ripper. Photo by NCBA CLUSA Mozambique.

WHAT IS NEXT?

Going forward, NCBA CLUSA plans to develop new inputs packages designed for other farmer profiles, including more vulnerable and more market-oriented smallholder farmers, giving farmers more choices than the current packages A and B. They also plan to design packages that are more closely tied with commodity buyers' product quality requirements.

One challenge facing the Green Discount Initiative is the existence of alternative input subsidies. Most notable are the government's flagship agriculture program, SUSTENTA, which provides seeds and other inputs free of charge to certain smallholders, and the Food and Agriculture Organization of the United Nations (FAO), which is implementing a European Union-funded inputs e-voucher project in some of the PROMAC II implementation areas. As the Green Discount subsidy decreases further, its comparative advantage decreases compared to more attractive subsidies on the market. However, there are several ways in which NCBA CLUSA counteracts this challenge and maximizes the benefits of each stakeholders' intervention. For example, PROMAC II coordinates with other donors and implementing organizations to minimize the overlap between subsidies (i.e., geographic area or target group) and maximize synergies between different programs where possible. Additionally, it plans to promote to key stakeholders, such as the government, the use of "smarter" input subsidies via commercial channels – rather than direct distribution.

In parallel, to ensure that subsidies translate into increased willingness to buy in the longer term, all NCBA CLUSA projects have a strong focus on teaming with private sector partners on both the demand and supply side of the inputs value chain. This includes demand stimulation through farmer extension, training and demonstration – essential components of any inputs discount initiative. It also includes support to private sector actors to more effectively and cost efficiently engage in the smallholder market, for example by buying down the risk for them to expand their agrodealer networks and to produce innovative, smallholder-appropriate products such as weather index insured seed and smaller package sizes.

CASE 4

A Market-Based Approach to Strengthening Local Seeds Systems in Niger

CASE STUDY BY CRS NIGER

THE PROBLEM WE ARE TRYING TO SOLVE

It is widely recognized in the scientific and grey literature and through field experience that high quality, certified seeds, in association with other technologies, can increase agricultural yields.[1] In Niger, however, certified seeds of improved varieties account for only 4% of the total amount of seed planted annually and their use largely depends on free distribution by the State and its partners. Additionally, at the national level, few producers buy certified seeds, less than 4% based on interviews with specialized research institutions conducted through a Seeds System Security Assessment.[2]

Prior to the project, Girma's intervention area was no exception. Although certified seeds were relatively well known, they were not available locally. This was largely due to limited production and marketing, combined with an uneven level of awareness about the potential benefits of using these within the community.

1 Ex Blum, M. L. (2016). Assessment and performance of input shops and producer organisations in Niger. FAO; IFDC. (2016). Fertilizer and Seed Sector Assessment in Niger. Thierfelder, C. et al. (2016). "Conservation agriculture and drought-tolerant germplasm: Reaping the benefits of climate-smart agriculture technologies in central Mozambique", Renewable Agriculture and Food Systems, v. 31, no. 5, pp. 414-428.

2 Walters, E. and Amadou, M.L., Seeds Systems Security Assessment. Girma project zone: Magaria and Dungass Departments, Zinder region.

Photo by Adamou Abdou Ali, CRS Niger.

About the Catholic Relief Services (CRS) Niger and the Girma Project

The Girma Project is a multi-sectoral development project (2018-2023) implemented by Catholic Relief Services (CRS) Niger in the departments of Magaria and Dungass (Zinder region). Girma is a Development Food Security Activity (DFSA) funded by USAID's Bureau for Humanitarian Assistance (BHA). Girma's overall goal is to sustainably improve food and nutrition security and resilience among highly vulnerable households and communities. With total funding of USD 70 million, the project aims to reach 842,645 direct participants living in 553 villages in the aforementioned departments.

To learn more about CRS Niger's Girma Project, contact Chief of Party, Jeanne Ella Andrianambinina (jeanneella.andrianambinina@crs.org) and/or Strategic Learning Lead, Martha Populin (martha.populin@crs.org).

As part of Girma's social and behavioral change strategy, at the start, the project conducted several studies and consultations with local stakeholders to identify behaviors critical to improving food and nutritional security. In agriculture, the selected behavior was "Producers buy and use certified seeds" (« *Les producteurs achètent et utilisent des semences améliorées* ») because it was identified as an essential, achievable, and currently little-practiced behavior that could lead to improvements in food security.

This case study details Girma's market-based approach to strengthening the local seed system through sustainable production and marketing of certified seeds.

HOW DID WE TACKLE THIS?

In view of the low availability and use of certified seeds, Girma opted for a market-based approach to promoting these seeds. The choice was motivated by a concern for sustainability. To ensure seeds continue to be available in the intervention areas once the project ends, Girma felt it necessary to work from the outset on establishing and strengthening the local seed production and distribution system. This approach, however, required the team to consider the low purchasing power of the majority of farmers and the competition from less expensive yet lower-quality seeds available in the market.

To set up this system, Girma has taken the following steps:

- Established a partnership with seed company Ferme Semencière Amaté (FESA, Amaté Seed Farm), based in the neighboring region of Maradi, which wanted to expand into a new area within Zinder. FESA had previously been a CRS partner in the PASAM-TAI project (2013-2018),[3] which promoted the purchase of certified seeds in the departments of Mayahi (Maradi region) and Matamèye (Zinder region).
- Each year over a three-year period in its 11 intervention communes, Girma identifies and trains 22 agrodealers on business skills and 22 seed multipliers on business skills and seed production (to date: 44 partner agrodealers and 44 partner seed multipliers in total).
- Each year, FESA participates in the training given by Girma and provides the inputs for seed production (i.e., foundation seed, fertilizer) to partner seed multipliers, who are jointly identified by FESA and Girma. FESA[4] then signs production contracts with the seed multipliers. Once the seeds are produced by the seed multipliers, FESA buys all the seed and markets them on consignment to the identified agrodealers. Unsold stock is returned to FESA headquarters at the end of the marketing year.

Related to contracting, FESA and the multipliers are bound by a written contract. FESA provides foundation seed that they produce and/or purchase from research institutions and buys back 100% of the seeds produced. The contract with the agrodealers, however, is verbal; it provides that agrodealers earn a percentage of 10% on sales below one million CFA francs (about USD 2,000) and 15% on sales of a higher amount. Seeds are sold in packs of 1 kg (millet and sorghum) or 500 g (cowpea). Prices are the same in all regions and outlets: 500 CFA francs (about USD 1.00) for millet, 660 CFA francs (about USD 1.32) for sorghum and 650 CFA francs (about USD 1.30) for cowpeas. The seed varieties sold include Subatimi, a sorghum variety selected for its high yield and use as fodder; Dubani and Na Kowa, two millet varieties selected for their shorter cycles than the local long-cycle millet varieties that are typically dry seeded; and IT90, KVX and TN varieties of cowpea, selected for their short cycles.

3 Projet d'Appui à la Sécurité Alimentaire des Ménages (French) – Tanadin Abincin Iyali (Hausa), funded by USAID/Food for Peace under the Development Food Assistance Program.

4 Percentage of FESA's certified seeds that are produced through Girma versus from other sources: cowpea seeds - 60%; millet seeds - 20%; sorghum seeds - 5%.

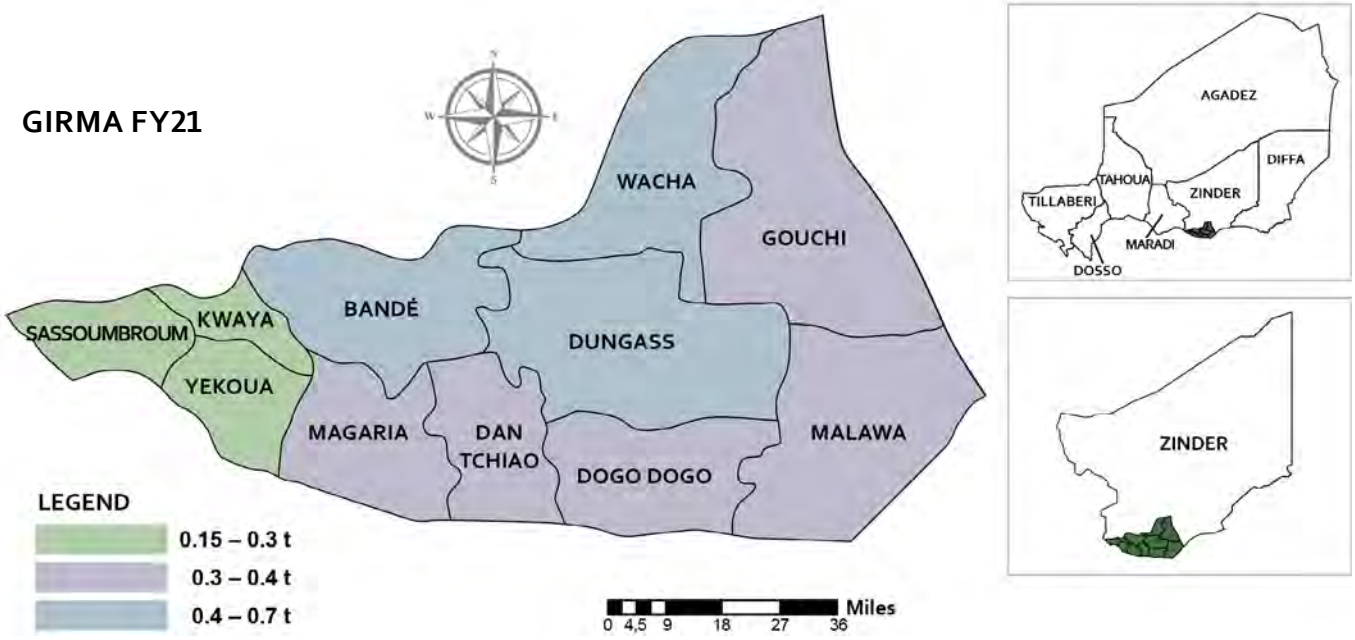
The program also planned for all agrodealers to run demonstration fields – fully supported by FESA. This scheme did not happen during the first two years of the partnership due to contract negotiations, but it is expected to begin in 2022. Girma contributes to 132 other demonstration fields in the project area. At this time, Girma is also supporting the transportation of seed between agrodealer outlets and FESA, where sorting and packaging are carried out. However, transportation will gradually be taken over by FESA.

KEY FINDINGS

In 2020, approximately 300 farmers bought 2.9 tonnes of certified seeds from the 22 Girma agrodealer partners. In 2021, this increased to 1500 buyers purchasing 3.9 tonnes from 44 agrodealers, well beyond the anticipated project target of 900 buyers. On average, farmers bought about 2.5 kg of seed per person in 2021. Seed purchases are not subsidized; farmers use their own money to buy the seed.

Overall, agrodealers have sold greater quantities of cowpea seed than either millet or sorghum. In 2021, agrodealers sold 1.3 tonnes of millet (40% of total stock available), 0.5 tonnes of sorghum (53% of total stock available), and 2.1 tonnes of cowpea (70% of total stock available). Cowpea varieties may have sold better given that it is a cash crop with a shorter production cycle than millet. With a shorter production cycle, trying new varieties is less risky; if the first one does not work, there is still time to sow another.

QUANTITY OF CERTIFIED SEED OF IMPROVED VARIETIES SOLD IN GIRMA'S INTERVENTION AREA (BY COMMUNE)



As shown in the thematic map above, total (absolute) seed sales differed by commune. Relative sales (i.e., proportion of total stock supplied to agrodealers by FESA that was sold) also vary from commune to commune, indicating a potential mismatch between stock and sales.

The differences in absolute sales can be explained in part by total population in these different communes; some communes have many more inhabitants – thus, potential clients – than others. Another explanation is the proximity of some communes to Nigeria where seeds, both certified and local, are readily available. The three municipalities with the best sales are furthest from the border. People in border communities are accustomed to living "on both sides"; some producers have their preferred agrodealer located in Nigeria and the recent devaluation of Nigeria's currency, the naira, has contributed to this trend.

Agrodealer in Magaria, Niger. Photo by CRS Niger.

Another reason for the mixed sales, especially in the southwest part of the intervention zone, was the mismatch between some of the varieties offered and the local climatic and soil characteristics. For example, the Subatimi sorghum variety was not in demand in the South where the conditions make it difficult to grow, but it sold well in the North, which is better suited to this variety. In addition, some farmers' production choices impacted supply. In the commune of Malawa, producers were looking for improved varieties of peanuts, but did not find any to buy. Producers requested the Dan Hadjia cowpea variety which performed well in 2020 but was not available to buyers in 2021.

In areas where sales were satisfactory, success factors included selecting sales outlets in high-demand locations and those owned by motivated agrodealers with a sense of marketing, like Hadiza Laouali in Bandé. She paid for local radio advertisements out of her own pocket. Moreover, the demand was strong because farmers had many opportunities for exchange and training with field agents (from Girma and sometimes other projects) and with pilot or lead farmers from farmer organizations. In this kind of context, neither the free distribution of seeds by other projects nor the presence of other certified seed supply channels (such as the Maison du Paysan in Bandé) created obstacles. On the contrary, all these channels worked in synergy to meet an already solid demand.

Despite the geographical differences in sales, Issa Amaté, owner of FESA, is generally satisfied with the results of the partnership. The network of agrodealers in the project area is effective. They created a WhatsApp social media group through which they can discuss and agree on seed transfers to each other in case of additional need without having to resort to FESA. In addition, sustainability of the seed actor linkages from PASAM-TAI project's old intervention areas is shown through FESA's continued supply of seed to the most successful agrodealers. FESA even expanded its network in PASAM-TAI's area after the end of the project and currently supplies 20 agrodealers (compared to 8 during the life of the project). FESA aims to do the same in Girma's intervention areas after the close of the project, i.e., maintain strong commercial relationships with successful agrodealers.

WHAT MAKES OUR MODEL WORK?

In a fragile context, where 25% of the population lives in a condition of 'extreme' vulnerability and another 28% is 'very' vulnerable, the development of a market for certified seeds is an ambitious goal. Girma does not provide seed directly to farmers; rather, it uses a market-based approach to facilitate relationships between seed multipliers, FESA and agrodealers. By linking FESA with seed multipliers, it is increasing the availability of high quality seed; and by linking FESA to agrodealers it facilitates seed availability in last mile shops.

To succeed, Girma relies on two pillars: prioritization and participation. First, deciding to take a market-based approach to the seed intervention was the result of a prioritization process among many other potential agricultural interventions. Second, the partnership approach with FESA, multipliers and agrodealers is the result of a constant "co-creation" where dialogue and bottom-up learning are fundamental. For example, during the training of agrodealers in 2021, the project suggested a marketing approach of working with commercial correspondents in villages without input shops. This suggestion came from successful steps agrodealers had taken in 2020.

The Girma model lays the foundation for a sustainable seed system. The project does not distribute the seeds; instead seeds are purchased by the producers from agrodealers. This model is made possible by the increased involvement of the local private sector in the project. The intention for the initiative after the Girma project ends, is that FESA, agrodealers and seed multipliers will be equipped to continue the production, processing, transportation, and marketing of high quality seeds, with seed buyers experiencing little to no change in supply or prices. In other words, all stakeholders, including farmers, will end up benefiting from the seed system.

Hadiza Laouali, an agrodealer in Bande. Photo by Adamou Abdou Ali, CRS Niger

WHAT IS NEXT?

On the basis of Girma's sustainability strategy, fiscal year (FY) 2022 will be the last in which the project will provide systematic support to FESA and the network of agrodealers and seed multipliers. From 2023 onward, there will be limited support, such as follow-up advice and help in resolving ad hoc issues.

During FY 2022, Girma will prioritize the following based on the lessons learned in 2021:

- **Priority 1: Intensify agricultural extension.** The 2021 experience showed the crucial role of extension in all its forms (e.g., demonstration fields/plots, climate change training, informal conversations) in creating an environment conducive to smallholder farmers purchasing high quality seeds. On this basis, extension will need to be intensified, especially in areas where Girma and other stakeholders have worked less and where seed outlets have been less successful. It will also be necessary for FESA to operationalize its system of demonstration fields/plots implemented by agrodealers.
- **Priority 2: Conduct seed system assessment to identify key points of sale.** The right selection of points of sale has been instrumental in encouraging purchases. For example, in 2021 in the commune of Bandé, Girma field agents, in collaboration with the commune's agricultural development advisor, conducted a seed needs assessment that enabled them to select villages with unmet demand for certified seed. The level of motivation of agrodealers was part of the assessment, allowing Girma to retain only those who were willing to invest in this activity. In 2022, it will be necessary to conduct the same kind of diagnosis in all municipalities. This could require Girma and FESA to make some difficult choices – for example, not renewing collaboration with a non-performing agrodealer or not opening additional sales outlets in certain municipalities for the benefit of other areas with higher demand. For areas close to Nigeria, an analysis will be required on a case-by-case basis. If there is a strong demand for certified seeds in the area, outlets may be opened or continued to be supplied; if this is not the case, it will be wiser to turn to other areas.
- **Priority 3: Match agrodealer seed supply with producer demand.** In low-performing areas, there is a mismatch between supply and demand with the presence of poorly adapted varieties or the absence of varieties in high demand. Each agrodealer has the opportunity to learn from its 2021 experience and to tailor its orders to the needs of its customers in 2022.
- **Priority 4: Collaborate with other development actors in the area to form a unified seed strategy.** In 2021, the presence of the *Maison du Paysan* in Bandé, the *Centre Semencier* in Magaria and the *Projet d'Appui à l'Agriculture Sensible aux Risques Climatiques*, funded by the World Bank, did not constitute threats to the performance of the agrodealers due to sufficient demand. However, without continuous good collaboration, this could happen in the future. It is therefore imperative that Girma and these initiatives work to define a common strategy for the sustainable adoption of certified seeds by producers in the intervention zone.

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