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AMEA Case Study on the ICCO STARS Program

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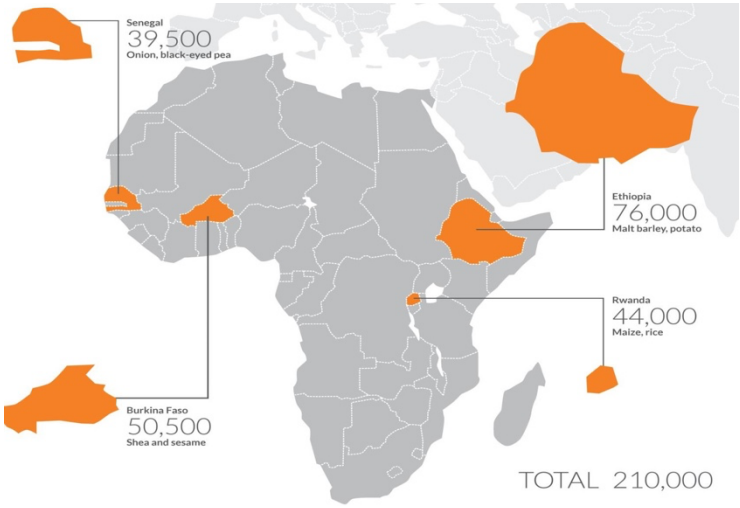
Introduction to STARS

The Strengthening African Rural Smallholders (STARS) program was an $18 million, five-year initiative (2016-2021) implemented by ICCO (now part of Cordaid) in partnership with the Mastercard Foundation and ICCO Terrafina to increase access to finance and markets for smallholder farmers in sub-Saharan Africa. STARS was implemented in four countries—Burkina Faso, Ethiopia, Rwanda and Senegal—to develop and test a range of products and services for improving the production, income and resilience of farmers. STARS took a Market Systems Development (MSD) approach and worked with groups of farmers organized in cooperatives, or "Producer Organizations" (POs), to build management capacity, increase production, forge market linkages and enhance access to finance. Guided by local teams of ICCO staff and consultants in each country, STARS facilitated a grassroots analysis of market gaps, supported local actors in developing and owning solutions, and aimed to catalyze systemic change that would continue organically beyond the life of the program.

Designed through a bottom-up approach in collaboration with a diverse set of relevant market actors, each country-level STARS program zeroed in on two crops—with different levels of value chain (VC) development—and combined agricultural, business development services (BDS) and financial sector interventions. Since they responded to specific needs and challenges of the selected VCs in each country, each STARS intervention package was unique, consisting of a highly tailored collection of solutions and activities (referred to collectively as Business Development Services, or BDS) to suit the local context and actors. Figure 2 offers an overview of the broad range of STARS interventions in two of the STARS countries and their selected VCs (Rwanda: rice and maize; Senegal: onions and cowpeas).

Figure 1: STARS Program Geography, Value Chains and Outreach



As would be expected, the results of the STARS interventions varied widely. A final program evaluation, undertaken by a third party and simplified as an outcome harvesting approach due in part to COVID-19 constraints, found many positive outcomes. Across the overall program in the four countries, a total of 70,000 farmers were trained and more than 200,000 were linked to finance, with women representing about 40% of beneficiaries. Farmers have increased their yields, product quality, crop sales and incomes. Farmers' savings have also risen, apparently due to higher revenues, better financial awareness, and the opportunity to qualify for bigger loans. POs have improved management skills, gained access to new markets, created internal finds for member loans and diversified their revenue streams. Numerous "deep dive" case studies, technical analyses and learning briefs have been published on the STARS program (see Annex A: Bibliography), describing STARS interventions and outcomes.

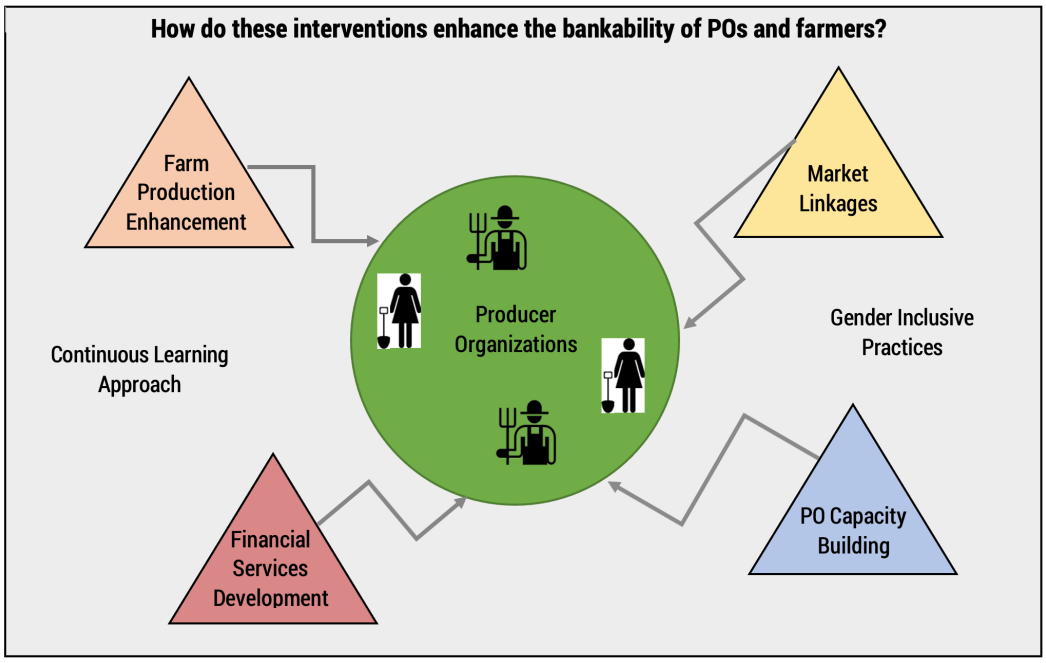
Figure 2: Comprehensive STARS Programme Components in Rwanda and Senegal

Intervention Category	Rwanda	Senegal
Farm Production Enhancement	• Farmer field schools • POs provide BDS fee-for-service (spraying, processing) • Harvest Tracking Approach • Seed multiplication (maize)	• Farmer field schools • Seed multiplication (esp. cowpea)
Market Linkages and Input Systems (B2B)	• Rice and maize offtakers • Other market actors • Rice seed multiplication system • Rice production plan in coordination with Rwanda Agricultural Board (RAB) by respecting crop calendar	• Seed multiplication • Sales to government and traders • Cowpea offtakers (bakers, others) • POs and onion traders • La Banque Agricole (LBA)
PO Capacity Building	• Cooperative management and financial procedures • Strategic plans and business plans • Gender committees • Improved decision-making approach • Increased PO control of members	• Manuals and tools • Business plan development • Gender inclusion • Leadership training • Financial management and accounting • Mlouma platform
Financial Services Development (offered by POs or FSPs), including capacity building and capital mobilization	• A-CAT tool and risk management Financial products – individual, group and cooperative loans better tailored to VC/farmer terms and needs • Refinancing from Rabo, Oiko • MFI savings mobilization • Change of FSP mindset toward ag sector	• A-CAT tool and risk management • Group solidarity loans • Warrantage • Solar panel loans • Increased MFI savings deposits • Bank-MFI financing

Purpose of This Case Study

The current case study, commissioned by AMEA, delves into a select set of STARS BDS interventions in two countries (Rwanda and Senegal), to shed light on promising approaches and lessons learned. Drawing on the diverse interventions and outcomes of STARS and the perspectives of actors on both the program and VC side, this case study aims to inform future programming to advance the agricultural production, livelihoods and bankability of farmers and their POs in sub-Saharan Africa and beyond. By sharing examples and lessons from the STARS experience, AMEA and Cordaid seek to add to the knowledge base that will help close the estimated $65 billion agricultural finance gap in Sub-Saharan Africa, realize the farm production potential of millions of economically poor smallholder farmers, stem food insecurity and increase economic resilience. Figure 3 provides a visualization of the main STARS intervention categories examined for this case study, with a focus on participating POs and their bankability. The case study narrative is developed according to the market stakeholders and activities shown in the Figure 3 schema.

Figure 3: How Do STARS Interventions Enhance PO Bankability?



Based on program documentation and a wide range of stakeholder interviews, this case study illustrates how STARS successfully brought these different market actors and activities together to spur market system change. No single intervention would have achieved significant results without the interplay of the other program elements. For instance, introducing POs to new input suppliers would not have been helpful if farmers were not convinced of the value of higher-priced, improved seed; connecting POs with new off takers would not have worked well if POs lacked the systems and capacity to estimate harvests and manage larger contracts; increasing crop production would have been impossible without new sources of financing; and financial service providers (FSPs) would not have increased agricultural lending without a better understanding of market opportunity and risk, including the ability to efficiently obtain and interpret PO- and VC-level data. The case study points to evidence that the STARS interventions are already being autonomously scaled within the VCs of Rwanda and Senegal, and that the STARS approach merits investment for replication in other VCs and countries.

The Results That Make STARS Inspiring

Before diving into the STARS approach in more detail, it is helpful to understand why STARS is worth examining. The STARS interventions overall were quite responsive to the needs and demands of POs and their members, and numerous program components are associated with positive outcomes. For instance, STARS helped to: spark new market connections (for inputs, services, sales); facilitate PO and market coordination; improve the POs' ability to command fair prices; build the productive capacity of POs, farmers, FSPs and other market actors; and increase financing options, sources and supply. STARS also improved the gender balance by increasing the participation of women in PO management, VC production, value addition and market engagement. Involvement in STARS appears to have also had spillover effects such as encouraging crop diversification that improved household nutrition, reducing the quantity of pesticides used, and attracting youth back to their villages for promising rural livelihood opportunities.

Although it is early to draw conclusions regarding sustainability (with the program having wound down during the same year as this case study was prepared), several interventions hold strong potential for scalability and sustainability. As will be further detailed below, it appears that a relatively modest investment in building the capacity of POs and forging direct BDS connections between market actors can indeed spark momentum that is carried forward on a self-sustaining, market-driven basis. This section presents some of the evidence that the STARS interventions are associated with significant increases in crop production and revenues, as well as financial services for POs and farmers.

Increases in Production, Sales and Revenues

STARS program POs, representing 44,000 farmers in Rwanda and 39,500 in Senegal, realized substantial increases in crop production and sales revenues. Over the life of the program (from 2016-2021), production rose in the rice, maize, onion and cowpea VCs by between 60% and 200%. Moreover, volume increases were accompanied by quality improvements, especially in maize, rice and cowpeas. In Rwanda, STARS participants increased their rice yields to 6.88 MT per hectare, compared to the national average yield of 3.6 MT, and achieved maize yields of 3.5 MT per hectare, against the national average of 1.6 MT. In Senegal, STARS farmers more than tripled the value of their cowpea harvests and discovered that this women-dominated VC can be even more lucrative than the prized groundnut VC. Considering the logistical constraints and economic downturn associated with the end of the program during the COVID-19 pandemic that began in 2020, these results are even more impressive.

Two tangential, anecdotal benefits to the production increases are also worth highlighting. First, the STARS capacity building in Good Agricultural Practices (GAPs) positioned some onion farmers in Senegal to better weather the COVID-19 crisis. According to Babacar Mbaye of the FADEC Sud PO located in Gaye Mekhe in Senegal:

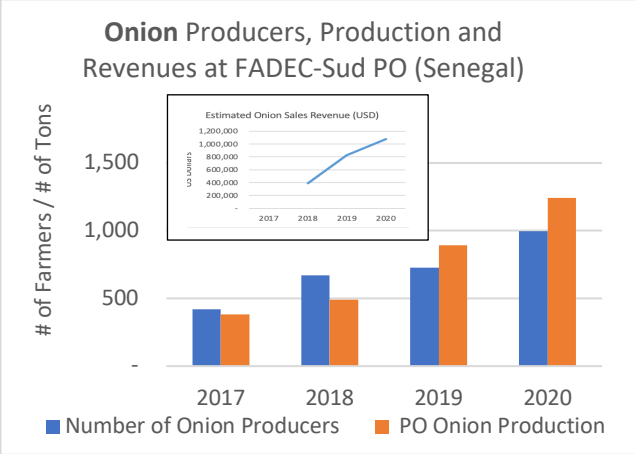
> *During the first wave of the COVID-19 pandemic, we noticed that the most resilient villages were those in the ICCO program. Not only did they have onion to sell locally to earn revenue, but also the exchange visit organized by ICCO had raised their awareness about planting other vegetables like lettuce, eggplant and sweet potatoes. Prior to the ICCO B2B exchange visit (where seed providers were present), the population had never planted those vegetables, but with transportation and markets shut down, they took the initiative to cultivate their own food. This change in both mentality and practice enables those communities to enhance their resilience and diversify agricultural practices.*

Secondly, there was more than one case observed of youth recognizing unexpected value in agricultural livelihoods and opting to abandon their livelihoods in the city or abroad to return to their villages and farm. One young Senegalese man told the research team:

> *I was working in Dakar as a vendor and having trouble making ends meet. When I visited home and began farming onions, I found that I was able to earn much more money, which allows me to meet my needs. I have even become a model in the village and am involved in every initiative or project here. When people come from outside the village, they always approach me. I do not have any regrets about returning home to invest in onion production.*

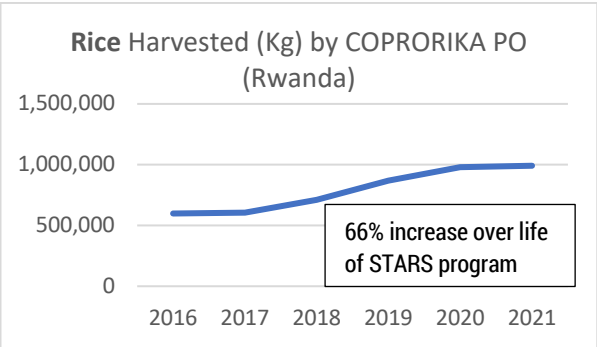
Figure 4 provides a glimpse of PO-level production changes and anecdotal accounts from farmers on this growth. With the increase in crop production, POs were able to attract trading contracts, obtain input credit, hire more staff to expand extension support, qualify for more and better financing, and command better market prices.

Figure 4: Changes in Crop Production Related to STARS



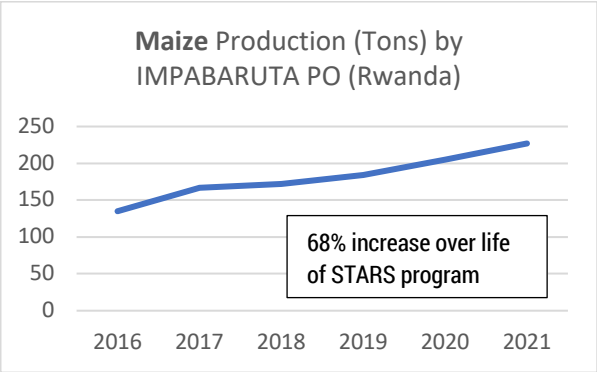
We have seen changes in onion production and revenue since STARS. From 50 tons of product, we now have reached 800 tons. –Leader of STARS-supported PO working in onions

As the chief of the village of Maka Sarr where the Women Self Help group GIE Bok Dolé is located, I have noticed that with the ICCO Program women got more revenue through the production of onion and other vegetables. And I have seen that they are more organized and their engagement and willingness to participate in production activities is very strong. Our village is becoming a model of development in the department. –Chief of the Village Maka Sarr



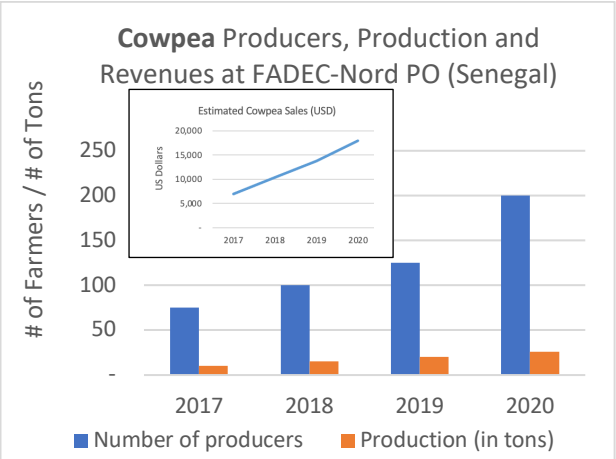
Before 2018, before ICCO was there, I used to produce 200kg of rice in my field of ¼ hectare, but after the ICCO intervention, my productivity started to increase each season, and now I am producing more than 900kg from that land.
–Rice farmer with STARS-supported PO

After working with ICCO… my production increased from 420kg on ¼ hectare to 1.2 tons due to appropriate chemical spraying. –Rice farmer with STARS-supported PO



Through [the STARS program's Farmer Field School], I learnt how to use properly the inputs and seeds, whereas before I didn't think about the quantity of fertilizer I applied or the number of seeds I put in one hole.
–Maize farmer with STARS-supported PO

Before, accessing extension services and training skills were not easy as we had only one agronomist. However today we have BDS providers who live nearby and are with us every day in our farming activities to provide technical support and guidance on improving our farming practices.
–Maize farmer with STARS-supported PO

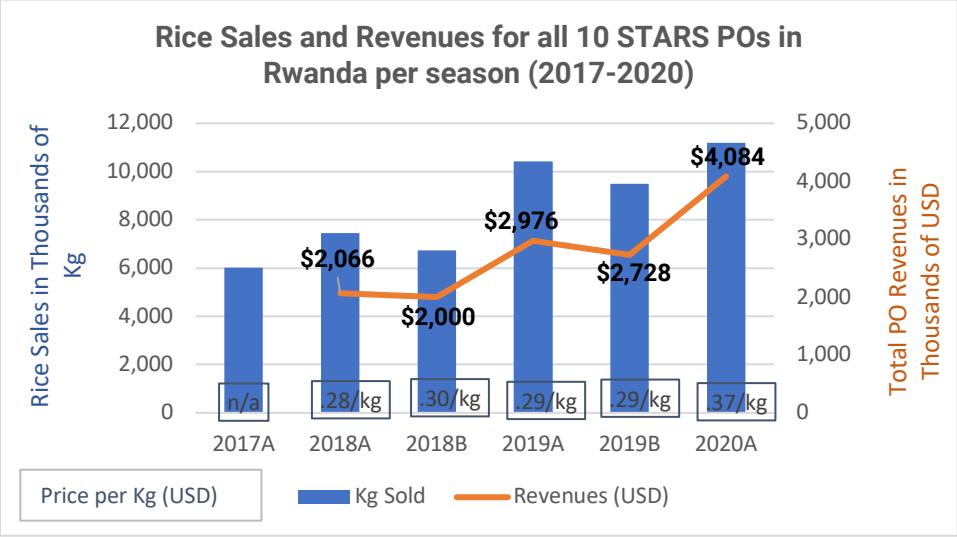


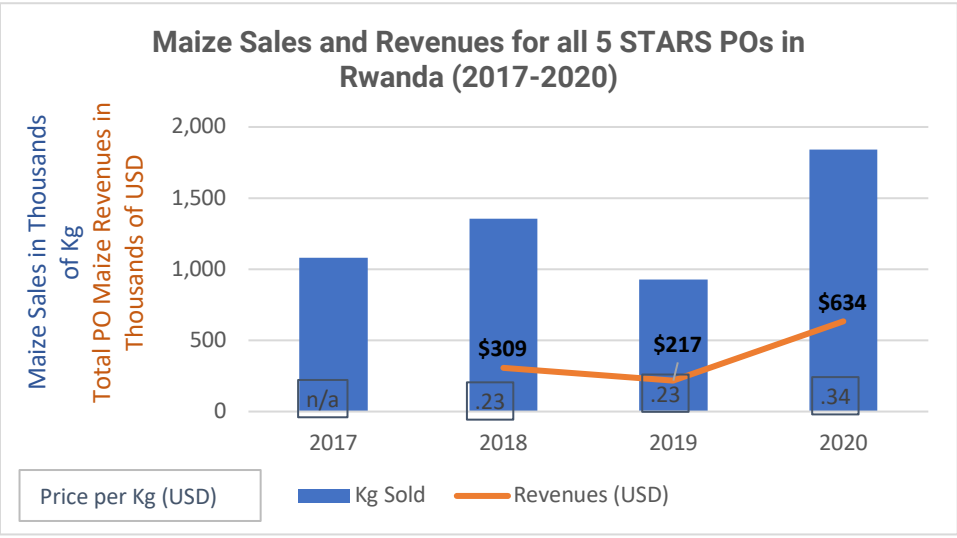
We have increased production of cowpeas in both quantity and quality during the last years. The improvement can be estimated at 100% as production went from 300 kg to 800 kg for the producers who participated in the ICCO project.
–Manager of STARS-supported PO (FADEC-Nord)

The increased participation of women has resulted in improvements in quality, productivity and revenue [of cowpeas]. The price of their cowpeas went from 100 to 500 FCFA per kilogram.
–PO leader with STARS-supported PO

Importantly, this growth in production also translated to increased sales revenues at the PO level, and we assume by extension (despite a lack of farm-level data), to increased income at the farmer level. In Rwanda, the 10 STARS rice POs combined realized a doubling of their sales over the course of the STARS program, from under $2 million per season in 2017 to over $4 million in the first season of 2020.[1] While the market price also fluctuated, reaching a high of $0.37 per kilo in 2020 due to a combination of market conditions and product quality improvements, the growth in rice sales tracks the increase in production, thanks to expanded contracts with processors and new sales relationships developed under STARS.[2] Similarly, maize POs in Rwanda also more than doubled their income from 2018 to 2020 (revenue data is not available for the 2017 season)—bouncing back from a major pest infestation in 2019 that devastated most of the country's maize harvest. Figure 5 illustrates these increases and show that the POs succeeded in finding buyers and good prices for their larger harvests.

Figure 5: Changes in Rice and Maize Sales and Revenues in Rwanda





(Note: Senegal PO Sales and Revenue data over the time horizon was unavailable.)

[1] The exchange rate used throughout this paper is RwF 1 020 to USD 1.

[2] Note that season "A" is the prime cultivation period for rice, whereas season "B" often entails unpredictable rains and flooding that compromises production—hence the lower overall production and sales in season "B".

Increases in Access to Finance

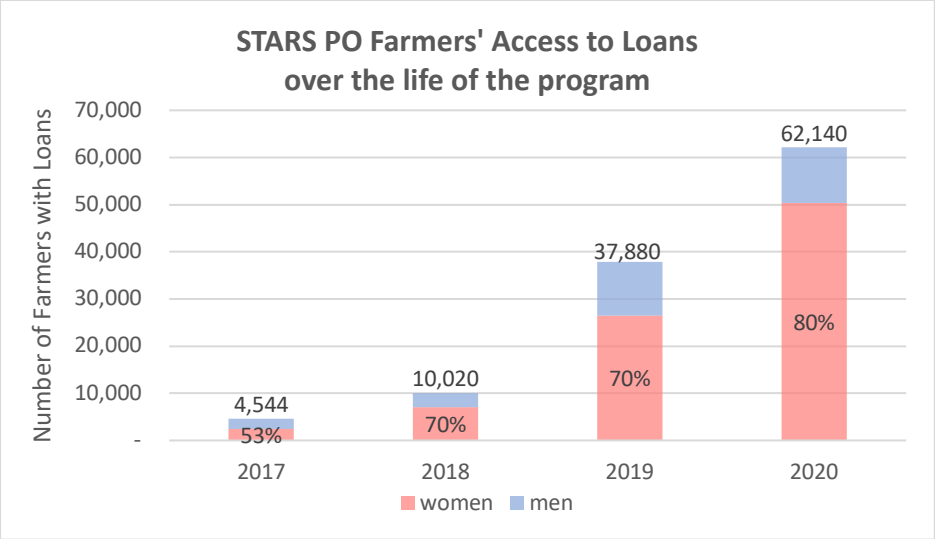
Improved access to finance for farmers was both an important program component and a notable outcome for STARS. STARS worked on the supply side (with FSPs to develop new financial products for farmers and to apply new risk assessment tools), and on the demand side (general capacity building of POs, along with PO and farmers financial education, to increase awareness of financial options and improve ability to qualify). Moreover, while not explicitly examined in the current study, agricultural insurance played a critical role in positioning some partners (e.g., in the maize VC in Rwanda) to access financing and participate in seed multiplication—and STARS provided technical support to POs on obtaining insurance.

Access to and usage of appropriate and affordable financial services are integrally linked to growth in farm production, revenues and operational capacity. In both Rwanda and Senegal, access to finance played a role in STARS program successes. For example, STARS' Senegalese PO partners credit the financing they received from LBA with enabling them to commercialize cowpeas. But better bankability went hand in hand with increased quality inputs, improved coordination of farm production, new B2B market linkages, better market information and improved negotiating power for POs and their members.

According to the end line evaluation, 66% of producers in Senegal cited "access to finance" as one of the most valuable interventions of STARS, but this came behind "access to inputs" (98%), and "market linkage" (91%). In other words, the increased access to finance fostered by STARS does not in and of itself account for the positive program outcomes. The holistic and integrated nature of the STARS interventions, coming together to address obstacles faced by multisectoral actors, served to demonstrate the value for everyone and to catalyze a virtuous cycle of increased production and market linkages leading to increased financing, leading in turn to increased production, market linkages and PO capacity—and so on.

As illustrated in Figure 6, access to credit and savings rose significantly among POs and farmers engaged in STARS. Further discussion and outcomes related to financial services, as well as increased production, under STARS are presented in the following chapter.

Figure 6: Changes in Access to Finance Related to STARS

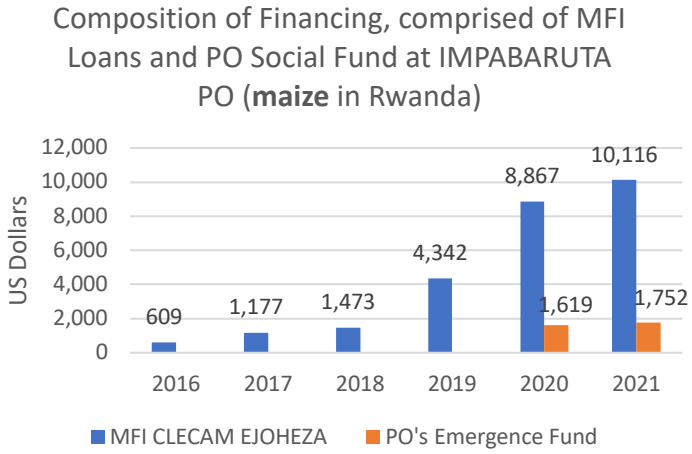


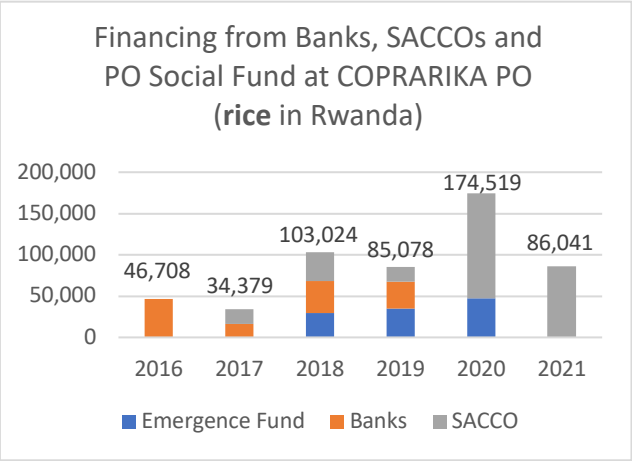
Me Individually, my farming activities were improved because now I can borrow money for my farming activities. Before, access to finance was a big challenge and prevented me from performing well my farming activities.

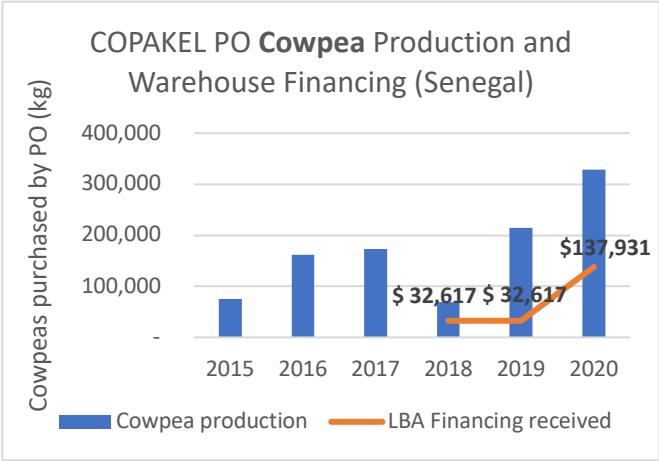
—Maize farmer, Rwanda

In the past seasons, before the facilitation of access to finance through saving group by ICCO, buying inputs (fertilizer and seeds) were not easy and sometimes I used to cultivate without fertilizers (NPK, UREA…) or I could use only a small quantity compared to what is required for maize farming. This affected my production negatively. But today I borrow money through my savings group or the cooperative emergence fund so that I can buy adequate inputs on time.

—Maize farmer, Rwanda







When bank financing dropped off due to the pandemic starting in 2020, STARS Rwanda rice POs were well positioned to fill the gap with financing from SACCOs and their internal Social (Emergence) Funds.

With MFI partner financing linked to the STARS-supported warrantage system in Senegal, cowpea POs were able to increase production by more than 50% (from 2019 to 2020). (*Note that a major pest infestation impacted the 2018 crop.)*

Case study methodology

The research and analysis underlying this case study took place from September through December 2021 by a third-party consulting firm working internationally as well as locally in Rwanda and Senegal. AMEA and Cordaid defined the main scope and focus, selecting the two STARS countries for the strong gains in financial access demonstrated by their PO partners and the high potential of some of their program interventions to be replicated more broadly. The consultants developed a methodology and research plan in coordination with AMEA, Cordaid and country-level ICCO staff—comprised of desk research, key informant interviews and focus group discussions with PO leadership, BDS providers and farmers in the field.

In the context of planning future investments and programming to improve farmer financial inclusion and livelihoods, AMEA and its members, including Cordaid, seek to examine:

- the nature and responsiveness of the capacity building provided through the STARS program to expand farmers' and POs' financial inclusion in Rwanda and Senegal (design);
- the extent to which improved access to finance accounted for positive program results (effectiveness); and
- mechanisms to enhance the sustainability and scalability of the successful B(D)S interventions in these countries (sustainability).

The case study therefore draws on the learning and outcomes of ICCO STARS in Rwanda and Senegal to inform AMEA members and other stakeholders on the design and implementation of future BDS programmes to maximize impact, scale and sustainability.

The study focuses on the POs/farmer cooperatives, examining how they have evolved in serving their members, how the STARS capacity building of the POs contributed to enhancing their bankability and access to agricultural finance, and recommendations for future programs. More concretely, the team sought to:

- Drill down on specific aspects of the STARS program to better understand the value added of technical assistance and BDS (including GAP related training and Business Plan development) in enabling smallholder farmers' access to finance;
- Examine the nature and responsiveness of the capacity building provided through the STARS program to expand farmers' and POs' financial inclusion in Rwanda and Senegal;
- Explore the extent to which improved access to finance accounted for positive program results;
- Identify mechanisms to enhance the sustainability and scalability of the successful B(D)S interventions in these countries;
- Conduct a "deep dive" into the design, delivery, effectiveness, financial inclusion outcomes and scalability of the services in Rwanda and Senegal;
- Distil learning on the additionality, effectiveness, and sustainability of the BDS and financial inclusion proposition of the STARS program.

The research, analysis, documentation and collaborative validation undertaken through this assignment provides a succinct, forward-looking case study report with recommendations for leveraging STARS program learnings to inform future programming, replication and scale-up among AMEA members and others working to enhance smallholder farmer resilience. A more detailed account of the approach and methodology is attached as Annex B.

- Given the changes in farm production and access to finance associated with STARS BDS, as illustrated above, what were the most promising interventions and lessons learned, what has changed among the key market actors, what appears to have sparked the change, what are the indications that the positive momentum will persist, and how can these experiences inform future programming?

STARS Program Design and Delivery

STARS Design Process

The STARS program design process emphasized extensive examination of local context, market gaps, and the expressed needs and preferences of POs and their farmer members, followed by collaborative and iterative problem-solving that engaged the full range of stakeholders. The overarching program objectives and design were set by ICCO in collaboration with Mastercard Foundation. STARS sought to cover a range of countries and agricultural contexts in sub-Saharan Africa, and to test BDS interventions with both staple and cash crops in VCs of varying degrees of development. The market research, PO partner selection, and implementation design were locally led by ICCO staff and consultants, with input from government agencies, financial institutions, public and private sector actors all along the value chains, farmers and PO managers.

STARS used SCOPEinsight (SI) assessments of numerous POs in the target countries (using *SCOPE Basic*). The first round of SI research, conducted in 2016-2017, examined PO capacity and potential along SI's standard eight dimensions (see inset box) with the goal of identifying appropriate PO partners for the new program. STARS intentionally set out to work with POs that were neither the most robust (which tend to be already on the right track to support their members), nor the most nascent (POs lacking the basic organization and skills to permit substantial advancement over the five-year program). Based on the SI scale of 1 (weakest) to 5 (very mature), the POs selected for STARS were rated primarily in the 3-4 range in Rwanda and the 2-3 range in Senegal at the start of the program. Selection was made by local ICCO staff, taking into account not only the SI scores but also a subjective analysis of organizational commitment and potential.

SCOPEinsight dimensions for measuring PO capacity

1 - internal management
2 - financial management
3 - sustainability
4 - operations
5 - production base
6 - market
7 - external risks
8 - enabling environment

Once a preliminary partner selection had been made, STARS tapped local VC experts to engage the POs in reviewing the assessment reports, considering their organizational goals, analyzing potential strategies for building capacity and sustainability, and developing action plans to address targeted gaps and weaknesses. The consultants visited the POs to listen, understand their challenges, guide them in identifying key areas for improvement and planning appropriate capacity building activities. Consultants then worked with local ICCO staff to confirm partner selection, develop training materials and manuals, deliver training and coaching, and support the POs in improving their management and business performance. Hence the STARS program design was demand-driven and tailored to the specific contexts and needs of the POs and their farmers.

Based on the extensive assessments and market research, the STARS program in each country was designed to address such common challenges as:

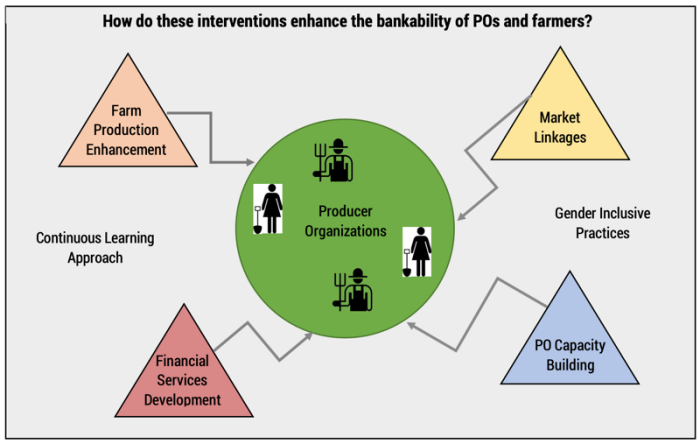
- Limited technical farming skills, especially related to irrigation, pesticides, farm equipment and post-harvest management
- Inability or unwillingness to purchase quality inputs (seeds, fertilizer)
- Low availability of and/or lack of access to appropriate financing and need for financial options for a range of purposes
- Low productivity and quality of crops; lack of awareness of potential value
- Sub-optimal cooperative organization and management, leading to lack of coordination to ensure stable yields and uniform quality, minimize side-selling and pursue market opportunities
- Lack of connection to input providers and markets, due to dispersed, hard-to-reach smallholders without knowledge or ability to identify, reach and interest such actors

- Weak bargaining position with off takers, low negotiating skills, insufficient market information and other factors
- Low participation of women in higher value crops and minimization of "women's" farm products

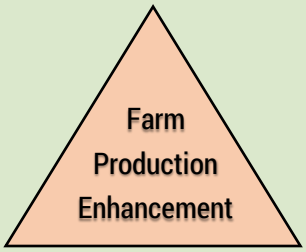
In response to these needs, BDS were developed and pilot-tested by STARS and partners. STARS ensured that there was ongoing communication and opportunities for exchange, fine-tuning and adaptation (as further discussed in the M&E and Adaptive Learning section below). Promising products and services were refined iteratively over time. The STARS program built in time to allow for small-scale testing, adjustment, scale-up and consolidation of learnings throughout the process, and the interventions and technical assistance focus evolved flexibly over the course of the program. (See Annex C for select capacity building plans, curricula and tools.)

STARS BDS Interventions in Rwanda and Senegal

From the outset, STARS took a Market Systems Development (MSD) approach to the interventions—that is, STARS aimed to build capacity and stimulate new market behaviors among a range of actors on both the supply side and the demand side, in order to enhance farmers' engagement in the market. Recognizing the multifaceted nature of market exclusion and the importance of uniting small, disparate producers, STARS focused on farmers grouped into Producer Organizations (such as farm cooperatives) and employed four main levers to increase market engagement, bankability and ultimately production and income of farmers (as presented above in Figure 3, provided again on this page for reference).



Although there is invaluable overlap and interaction between all categories of intervention, this case study zeroes in on select examples to illustrate the different categories, describe the STARS BDS activities, show how they were implemented in each of the countries and shed light on the effects these have had on the market actors. Rather than providing a comprehensive overview of the STARS program and its extensive BDS efforts, we present the interventions that appear most promising in terms of outcomes, scalability, sustainability and industry learning. It is critical to note that evidence points to the ***holistic combination*** of services as the key value created by STARS—bringing together the stakeholders and resources needed in **farm production, market linkages, PO capacity and financial services** to spark market change. Below, we treat each category of intervention in turn with key examples and details from each country, in order to provide a rich picture of how the interventions work together to bolster the productivity, revenues, bankability and resilience of POs and their farmers.



In both Rwanda and Senegal, STARS set up "Farmer Field Schools" (FFS)—demonstration plots embedded in the communities and fields of PO members for the purpose of hands-on testing and showing the value of new seed varieties, cultivation and maintenance techniques. FFS are not new, but the way they were implemented under STARS had a strong impact on POs and individual farmers. The STARS FFS in many ways formed a foundation from which to boost crop production, build BDS and attain scalability.

Farm Production Enhancement: Rwanda

In Rwanda, the FFS ultimately formed the basis of a decentralized network uniting PO members for a variety of purposes. While the Rwanda Agricultural Board (RAB) had already introduced FFS among individual farmers on hillside lands without great success, STARS brought a similar methodology to cooperatives in the marshlands for the first time. Embedding FFS in cooperatives (especially but not only in the well developed rice cooperatives) has provided a valuable foundation for a range of self-sustaining services. Incorporating FFS within POs has enabled the demonstration plots to flourish and even to kindle a network of local agricultural extension assistants.

> *Before ICCO help us to set up a team in charge of chemical spraying, we had a mismanagement of pesticides…. before my production cost was 35,000 RWF because of poor use of pesticides and lack of enough knowledge, but now I spend only 7,000 RWF on production. On the side of cooperative also, the pesticides used before were double those used today.*
>
> —Rice farmer, Rwanda

First, FFS "facilitators" were identified among PO membership, either via nomination and election by the members, or via hand selection by PO leadership. The FFS facilitators were thus trusted members of the farming community, directly selected by their peers. Each FFS facilitator received training and technical assistance from STARS staff and consultants to establish and manage a demonstration plot on a portion of their land (*note: the land is government-owned, and the farmers are granted a plot on which to cultivate, which provides leverage for POs to use to ensure compliance with practices and production criteria*). By working closely with FFS facilitators who in turn had the confidence of their fellow PO members, STARS was better positioned to engage meaningfully with farmers. For example, STARS helped encourage agricultural insurance uptake among farmers who were not accustomed to paying for insurance.

> *Before, access to extension services and training skills were not easy as we had one agronomist. However today we have BDS providers who live and work with us every day in our farming activities for technical support and guidance on how we can improve and providing training through Farmers Fields schools.*
>
> —Maize farmer, Rwanda

The FFS facilitators applied inputs and farming techniques (for rice and maize, depending on the PO) according to recommendations from STARS and the PO staff agronomist. Farmers in the area attended training events at the nearby plot and got to see firsthand the differences in plant health, product quality and harvest volume. The small groups of farmers worked together on the demonstration plots and their own land to experiment and learn new skills. The FFS Facilitators are considered by members to be "small agronomists," or assistants to the PO staff agronomist.

> *When I need coaching or assistance by BDS I find it directly, while before it was not easy to see the agronomist when I had a problem.*
>
> —Rice farmer, Rwanda

One prominent example of the FFS impact on farm production enhancement in Rwanda is coordinated pesticide spraying. Through the FFS and the decentralized network of FFS facilitators, STARS showed rice farmers how to manage spraying across entire

areas so that the impact is maximized (pests are eliminated rather than moving from field to field), which led to a reduction in the amount of chemical spray needed. Less pesticide means lower economic as well as environmental and health costs. The boost in rice production was so marked that some POs landed credit from rice processors to cover the annual spraying cost, and FFS facilitators became paid service providers to the POs. Moreover, thanks to the pre-existing organization of the rice VC in Rwanda—with community-level cooperatives grouped into district-level unions, and united by a national federation—the success of the spraying and FFS facilitators caught the attention of the rice federation, which went on to adopt the approach and disseminate it throughout its network of unions and cooperatives nationwide.

> *I am one of the eight people who benefited from the Farmer Field School. I can attest that there is a big difference in terms of production technique, inputs before the program and now. Before we were using seeds we would buy in the market, and the value of product was not significant. Buyers sometimes paid less than 100 CFA to buy 1 kg. But when I hosted the Farmer Field School, applied the production techniques and got to see the production from improved seeds and the bio fertilizer, I saw the value of cowpeas. Cowpeas now have more value than peanuts, which are the biggest commercial crop in Senegal and in the region.".*
>
> —Cowpea farmer, Senegal

Initially, the FFS facilitator received a stipend from the STARS program to motivate engagement. As farmers gradually adopted the recommended inputs and practices, their yields increased in size and quality, and the POs and their members saw substantially increased revenues. The role of the FFS facilitators expanded beyond the demonstration plots per se, to include other activities further described in other categories below. As a result of the revenue gains and in recognition of the value that the FFS facilitators were creating, the POs incorporated the FFS facilitators into their annual budget. Since the end of the STARS program, the FFS facilitators have continued to perform their functions. They receive technical support from their PO agronomist, who was previously stretched too thin to provide robust and timely support to all members. And FFS facilitators receive compensation from the PO according to an annual vote by members at the General Assembly.

Farm Production Enhancement: Senegal

In Senegal, the FFS served to demonstrate to farmers the value of two crops—onions and cowpeas—that were well-known and widespread but were not achieving their market potential and thus were underestimated by producers. As in Rwanda, farm inputs including seed and fertilizer were a critical component of the FFS. STARS organized B2B meetings that brought together POs with input suppliers, resulting in partnerships between POs and input suppliers (the company Béjo for onions and the producers' network RESOPP for cowpeas), whose product offerings include high-quality seeds and organic fertilizer. The FFS then combined hands-on testing and observation of these inputs with STARS technical assistance.

The differences in context and STARS' emphasis on promoting locally designed solutions meant that FFS were different in each country. The POs in Senegal are much larger than in Rwanda (an average of 5,000 members per cooperative, compared to a few dozen per cooperative in Rwanda) and are less structured and organized (owing in part to Rwanda's active public agency for cooperatives and laws governing their management). Instead of the decentralized dissemination by FFS facilitators seen in Rwanda, each PO selected eight farmers (tapped by PO leadership) to host demonstration plots and receive free farm inputs and technical training during the program. These farmers participated in exchange visits and trainings organized regularly by STARS.

The FFS had an important impact on farmers' perspectives on onions, a commodity in Senegal. People sometimes farm onions for their own household use, and while most farmers are aware that there is higher-priced onion seed available, they were not convinced that the output would compensate for the price and preferred to stick with much cheaper seed. Through the FFS, farmers were provided with higher quality seed and other inputs, along with new techniques for onion production—and they discovered a

huge difference. Over the life of the program, onion production more than tripled among participating POs, the number of onion producers more than doubled, and PO revenues nearly tripled (onions are highly subject to market price fluctuations). STARS also raised awareness among participating farmers that onions could be grown during the rainy season—a time when many had unplanted fields awaiting other crops.

> *ICCO STARS opened our eyes to the opportunity of the onion value chain in the Kadior region [where onion was not previously grown]. Before the program, we were focused on traditional crops like millet and peanut. ICCO identified potential in the onion VC for our area and provided the support needed to show farmers the value of investing in onions. Even the farmers who were producing onion before lacked technical expertise, and their investments were not profitable. With ICCO's training and the B2B meetings where we connected with input providers, plus the farmer field school, things started to click.*
>
> —FADEC Sud manager, Senegal

In addition, the onion farmers who participated in STARS-sponsored exchange visits were inspired to diversify their farms to include horticulture. The prerequisite of having a reliable water source in order to cultivate onions meant that onion farmers could also feasibly plant eggplants, peppers and tomatoes—which was something that few had even considered feasible. Following an exchange visit where free seeds were provided, the farmers tested new vegetable and fruit crops on their land. This had a notably positive impact on the nutrition of some communities and helped sustain some families during the COVID-19 transportation and market shutdowns.

The FFS had a similar impact on demonstrating the potential and raising the value of cowpeas. This is discussed more under Market Linkages, below.

Stimulating VC development through market linkages has been one of the most valuable contributions of STARS. In both countries, STARS organized meetings that brought together POs, input suppliers and off takers, as well as financial institutions (discussed more below). STARS strived to be a neutral arbiter, simply introducing value chain actors, pointing out potential relationships, and allowing them to select their own partners.

Market Linkages: Senegal

> *The main impacts of the program are that POs have developed relationships with main seed providers (Tropicasem and Bejo), so that the POs can now distribute inputs to their members and gain some financial margin, in addition to members' savings increasing due to improved revenues.*
>
> —FADEC Sud leader, Senegal

While (as described above) the FFS in Senegal demonstrated the possibilities of onions and cowpeas to a small number of select farmers, the commercial B2B linkages with input suppliers is what enabled that learning to be amplified and to reach thousands of farmers. As farmers increasingly purchased quality seed from Béjo and RESOPP and fertilizer from Eléphant Vert, the numbers of onion fields multiplied, and average yields grew; eventually the input suppliers saw strong enough demand and reliable enough production volumes to begin providing seed to POs at wholesale prices and on credit. At harvest time, the POs collect the retail price of the inputs from their farmers and retain the margin.

Cowpea farmers also benefitted greatly from the B2B linkages that STARS helped forge for POs with input suppliers. Cowpeas, which are traditionally farmed by women, can be grown in a wide variety of conditions. Among the STARS POs, farmers cultivating cowpea were doing so on a small scale and primarily to use or to sell as animal feed at 100 FCFA (about $0.20) per kilo. With improved seed, farmers multiplied

production by 100% to 200%, harvested cowpeas of a quality that fetches five times the sale price at 500 FCFA (almost $1) per kilo, and even use the sub-product to feed their own animals or to sell as feed for additional income. The market price for quality cowpea turned out to be double that of Senegal's most popular cash crop, groundnuts, at 225-250 FCFA per kilo. And while groundnuts take 4-6 months, cowpeas are ready for harvest in just 45 days. Farmers were astounded to discover that cowpea—traditionally relegated to women as a small, low-value crop—could be such a boon.

STARS also provided support to POs to identify and set up market linkages for off taking. After upgrading their cowpea production, one STARS-supported PO, COPAKEL, won a call for tenders to supply to the national school lunch program (Transition Alimentaire dans les Cantines Scolaires au Sénégal, or TACSS) and also is supplying cowpea to the World Food Programme. STARS raised the PO's awareness of the opportunities and provided some technical assistance in responding to the tenders. According to project documentation, one PO received an advance of 40% on their cowpea crop, which the farmers said was more than the total revenue they usually earned in a year.

In these examples, STARS played the pivotal role of convener. It is not that the improved seed, organic fertilizer, proven cultivation techniques, input suppliers and willing off takers did not exist—nor even necessarily that the farmers were unaware of them. What was needed was first proof that there was real value in investing to improve quality and production (demonstration provided by the FFS), and secondly: bringing all the potential partners together to explore commercial relationships (the market linkages). Béjo would not have been able to find the relevant farmers without them being grouped and having interest; farmers would not have gone looking for Béjo when they viewed onions and cowpeas as low value crops not worth their time and investment. This simple but vital catalyzing role is central to MSD.

Market Linkages: Rwanda

The data collected from Harvest Tracking are important and necessary for the buyers because when a buyer is going to give the cooperative money for advance on production to the farmers before starting harvesting activities, he uses the quantity estimated during the harvest tracking.
—Rice farmer, Rwanda

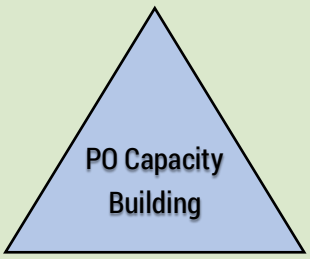
The STARS ***Harvest Tracking Tool*** (HTA) was especially beneficial for market linkages in Rwanda, where POs leveraged the new STARS-promoted network of FFS facilitators to estimate and track their members' harvests more systematically. Relationships between rice POs and processors, as well as maize POs and off takers, already existed when the STARS program arrived. And the particular land-ownership arrangement of marshland farmers in Rwanda, who are granted the privilege to farm on government land managed by certified POs, equips POs with the ability to revoke the land of farmers who do not comply with certain PO rules and criteria.

Although prior to STARS, the POs informally estimated their harvests, their relationships with off takers and FSPs were hindered by poor estimation and farmer side-selling. Without the ability to negotiate prices for a large and reliable volume of product, or in the face of insufficient product delivery to the buyer at harvest, the PO suffered financially and operationally. Meanwhile, farmers' trust in the PO to secure a good price was undermined, which led to more side-selling. Farmers might plant PO inputs but then sell off a portion to another buyer, and without a clear handle on production, POs were ill-placed to obtain input credit or FSP loans. With just one agronomist making the rounds across a wide area and without a clear and transparent process, the PO struggled to prevent the drain.

The HTA is a simple and straightforward process of periodic estimation of production per farmer. Farmers plan their production and submit their input needs to the PO at the start of the season. During the season, the FFS facilitator checks in regularly with all of the farmers in their catchment area, monitoring the crop and reporting back to the PO leadership. At

Before implementing the HTA in our cooperative, we were collecting only 280 MT but now can have 410 MT of rice harvest collected each season.
—Rice farmer, Rwanda

the end of the season, the farmers deliver their harvest, and the PO verifies that the volume corresponds with the inputs and estimate. With the help of the decentralized system of FFS facilitators who are present, known and trusted in the community, the HTA has enabled 95% accuracy in production estimation, curbed side-selling and led to better bargaining power with off takers, resulting in higher volumes, better prices and increased income for the PO and its farmers.



STARS BDS services included intensive capacity building for POs, according to their needs and objectives. Technical assistance provided by STARS staff and consultants included: training on general, financial and operational management; gender awareness training and support for ensuring that gender quotas were met; development of formal operating procedures and manuals; collaborative development of business plans and actions plans; preparing records and applications to successfully secure financing and sales contracts; and systematizing PO member meetings and decision-making. This technical assistance played an important role in all of the program components and in establishing the capacity and systems to continue their growth and momentum after the end of the program.

PO Capacity Building: Rwanda

A good example of this STARS component is the development of the Rwandan maize POs' capacity to become seed multipliers. Seed multiplication is highly regulated and requires strong cooperative organization, management and documentation, on top of specific agricultural handling skills. By becoming seed multipliers, the maize POs could reduce their input costs (by using local seed rather than imports) and have a reliable source of seed. STARS supported maize POs in meeting the stringent technical and administrative criteria, and then in applying to the Rwanda Agriculture Board (RAB) for approval. By reinforcing the POs' leadership and their structure of farmer organization in groups and zones, by improving production estimated and limiting side-selling, and by training farmers on the GAPs necessary to produce quality seed, STARS catalyzed a new, additional line of business for the POs in seed multiplication.

Similarly, the organization of BDS providers in the rice VC to offer spraying services requires strong organizational capacity. In addition to the FFS facilitators, whose stipend is decided by members, the STARS rice POs organized a network of community-level pesticide sprayers, who also receive compensation from the PO. These entrepreneurs received STARS training on safe and appropriate handling and provide services in their area. This helps to ensure not only proper, coordinated and systematic spraying, but also provides an important service for farmers who are unable to spray their own fields (e.g., pregnant women and mobility-impaired). This system has proven to be self-sustaining once put in motion with the support of the program, and its success has led to the national rice federation's adoption of this decentralized BDS spraying model throughout the country.

In terms of PO-level data management, the Rwandan POs are solid. Due to government regulations on staffing and recordkeeping, POs (which are VC-specific) maintain up-to-date records on their members, including name, location, land area, seasonal production, PO financing and input requests. These PO databases are populated with data collected by hand in hard copy in the field. With the creation of the FFS facilitators, this task became decentralized, making it more reliable and more efficient (the FFS facilitators report their figures to the cooperative level, where they are aggregated). The PO office staff (manager, accountant and/or agronomist) enters the hard data into an Excel file, where the data is used to produce reports for PO management and commercial partners. The Rwandan POs hence have what they need in terms of a PO database, which they continually update and utilize for partnering.

PO Capacity Building: Senegal

> *Our PO operations and business performance have changed since STARS. We went through a crisis, and in 2017 when ICCO came, we started operations again. Members were not even coming to meetings, but now they do.* —FADEC Nord manager, Senegal

The POs in Senegal are somewhat less structured than in Rwanda, and this constrained STARS' ability to introduce innovations, take activities to scale and pave the way to long-term sustainability beyond the program. As mentioned, the Senegal POs typically have upwards of 5,000 members, and without a tiered and decentralized organization structure, tracking membership and production is a challenge. They are currently weak in production data collection and management, and while the creation of a PO database is badly needed, it is overarching cooperative organization, decentralized representatives and basic processes that need to be instituted to permit efficient, accurate and regular data collection. A new government initiative is underway to facilitate the creation of POs through the decentralized offices of the Ministry of Agriculture. By increasing the number of farmer groups that transition to the more formal status of cooperatives, Senegal may begin to see enhanced development of PO structures and management.

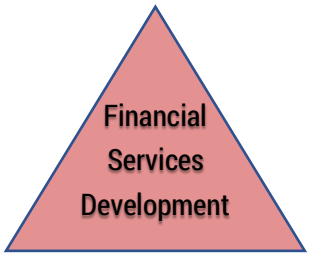
> *Since ICCO introduced training on warrantage (warehousing) and at the same we got financing from LBA (La Banque Agricole) after the B2B session, we have seen a clear difference in the organization of the cowpea VC in Kebemer. Before the warrantage, buyers would decide on the price of the crops and if one farmer refused to sell at that price, others would sell. In this situation you don't have any power. The other good aspects of the program are the introduction of the seeds and other inputs, which has revolutionized the VC and our profitability. Whereas we were only producing about 300 kg, we are now able to get more than double, like 800 kg. And the price has gone up because of the quality—our price has gone from 100 FCFA to 500 FCFA per kg. The profitability is even higher than peanut.*
>
> —Cowpea farmer, Senegal

STARS worked successfully with two cowpea POs (COPAKEL and FADEC Nord) to launch warrantage (warehouse finance) systems, which had a positive impact on PO leadership, management and financial performance. STARS staff and consultants provided training and technical assistance to the POs to develop the warrantage system, obtain or rent storage space, identify appropriate packaging, train staff on storage practices and manage the stocks. STARS organized B2B meetings between the POs and banks to explore financing. An agreement was formed between the commercial bank La Banque Agricole (LBA) and the POs with the technical support of STARS.

Under the warrantage system, MFIs lend to the POs so that the POs can provide credit to farmers upon request before the harvest is sold. This helps protect farmers from accepting below-market prices by side-selling when they are strapped for cash and improves farmers' financial options. Warrantage also permits the PO to count on a larger and more reliable volume of product, improves the bargaining position of the PO vis à vis off takers, and contributes to a better overall organization of the value chain.

The introduction of the warrantage system has thus had a huge impact on POs' bargaining position in the market—which has played a role in the strong, positive trend in the price that POs earn for cowpeas. It has also enabled the forging of new business relationships and the linkage of POs of largely female smallholder farmers to a major commercial bank. At one PO, COPAKEL, for example, the warrantage system led to LBA financing of $32,600 in 2018 and 2019, and $138,000 in 2020. This corresponded with a doubling of production between 2016 (before the engagement with STARS) and 2020 and more than a 50% increase from 2019 to 2020 alone.

The warrantage experience has built confidence as well as skills among PO managers and members, and since the cowpea VC is predominantly female, women farmers have especially benefited. This capacity building, in combination with other STARS program components, has thus created a higher income stream for POs and also reportedly contributed to an increased motivation and entrepreneurial spirit within the POs.



As introduced above and in Figure 4, STARS worked on both the supply side and the demand side to increase the availability appropriate financial services and financing options for POs and smallholder farmers. In Rwanda, as of the end of 2020, nearly 74,000 STARS farmers (57% of them female) had received an agri-loan and had saved more than 56,000 USD. In Senegal, access to finance more than tripled between 2017 and 2019, with women representing 70% of loan clients in 2019—before plummeting in the second half of 2020 due to the COVID-19 context.

Financial Services Development: Senegal

In addition to the warrantage product developed under the program and described under PO Capacity Building above, STARS also worked on the supply side with FSPs to enhance their capacity to extend agricultural credit. In Senegal, as in other countries, STARS collaborated with MFIs to develop and implement the Agricultural Credit Assessment Tool (ACAT), which equips non-agricultural credit staff to assess finance risk in select agricultural VCs. One Senegalese MFI, UIMCEC, credits A-CAT with revolutionizing their agricultural lending. As a result of the new tool, UIMCEC mainstreamed A-CAT across all its agricultural credit portfolio nationwide and plans to train its loan officers to keep the tool's agricultural VC data updated. See *AMEA Tool Highlight - Equipping FSPs to Expand Agricultural Finance: The Agriculture Credit Assessment Tool*, and tool comparison inset box, both below.

ACAT vs. AGRA Bankability Metrics

- **ACAT** is VC-specific, providing key benchmark data on production areas, input costs, estimated volume, market prices and crop timing; this makes it more feasible for loan officers who are not ag experts to assess credit risk and apply appropriate terms. Many STARS FSP partners have embraced the A-CAT as an important key for gauging agricultural lending risk and expanding their agricultural portfolios. The Rwanda POs would easily be able to provide FSPs with the data necessary to apply the ACAT, because their decentralized crop data collection and management system makes the information readily available. In Senegal and other countries, the ACAT has been used with great success by STARS FSP partners and other MFIs, via field inspections carried out by loan officers equipped with the relevant and up-to-date A-CAT.

- Alliance for a Green Revolution in Africa (AGRA) has developed a streamlined set of "bankability metrics" to increase the supply of agricultural finance (by standardizing agribusiness measures, reducing risk and rendering the sector more transparent), as well as to help boost the ability of agribusinesses to successfully land financing. **AGRA Bankability Metrics** are geared for agribusinesses with financial management capacity, calling for data on production, prices, revenues and other data for calculations like return on assets and equity. In Rwanda, the POs would be capable of producing the data for these measures (perhaps with some support). In Senegal, the POs do not yet typically have such data. Small farmers in both countries are unlikely to have such business data and financial ratios, which makes it difficult to access external financing. The bankability metrics are geared for loan applicants with strong financial management capacity, or FSPs can request that POs contract SCOPEinsight assessors to assemble the necessary data.

AMEA Tool Highlight

Equipping FSPs to Expand Agricultural Finance: The Agriculture Credit Assessment Tool

To increase the availability of agricultural loans to farmers, the STARS program collaborated with MFIs to develop the **Agriculture Credit Assessment Tool (ACAT)**. ACAT equips FSPs with crop-specific information and benchmarks that enable them to better assess and manage risk, determine appropriate loan amounts, structure realistic loan terms and monitor their agricultural portfolios. By clarifying the input needs, growing calendar, market prices, cash flow cycle and production risks of common local crops, the ACAT allows even FSPs and credit officers with little or no agricultural expertise to successfully expand and monitor their agricultural portfolios.

In order to develop the ACAT, STARS worked with agronomists, POs, government extension services, agribusinesses and smallholders to collect and triangulate data on select VCs. After populating the **Excel-based tool** with this **agronomic and farm income flow data**, STARS worked with FSPs to design appropriate loan products (including outreach, delivery, pricing, repayment schedule, analysis methods and compliance with internal procedures). STARS also analyzed potential linkages with nonfinancial services (for instance FFS) to reinforce crop resilience, production and credit outcomes. FSP credit officers and training staff were trained on the tool and its integration into the FSP's standard credit file, and a pilot phase allowed for adjustments to enhance useability as well as client satisfaction. Once in place, the ACAT has been and continues to be scaled up within FSPs and diversified to cover new VCs (such as livestock in Senegal).

ACAT has proven to be invaluable as a **systematic, practical and informative approach** to expanding agricultural finance, but it does require the FSP's upfront and ongoing investment to be viable. To successfully implement ACAT, FSPs must be prepared for such long-term investments as:

- Initial research and population of the tool with **local, VC-specific cultivation and market data**, as well as seasonal updates of this data to keep the tool current and reliable; this may necessitate some initial external technical assistance and an internal agronomy expert over the long term
- **Integration of ACAT into the FSP credit process**, including credit applications, loan approval processes, MIS and business planning—along with the FSP operational and credit manuals that document and guide all these procedures
- **Internal training** and coaching on ACAT to ensure strong understanding of and appropriate utilization of the tool among credit and other FSP staff (which often experiences regular staff turnover); STARS developed a special Training of Trainers toolkit to facilitate this
- Early communication with clients and planning ahead for seasonal credit applications and disbursements to avoid bottlenecks and successfully **handle increased demand** for time-sensitive agricultural lending

STARS program experience yielded these recommended **prerequisites for FSPs** seeking to implement the ACAT:

- **Strong leadership commitment** to serving rural smallholders: The process required to benefit from the ACAT is institution-wide, and experience shows that if FSP management does not actively support agricultural finance expansion, the tool's usefulness is compromised.
- **Staff capacity** to apply and utilize the tool: Staff needs to have enough technical skill and time to interpret and analyze ACAT data and to conduct the follow-up monitoring (such as entering actual production data), and an in-house agricultural expert is important for updating the tool and providing ongoing guidance to non-agricultural staff.
- **Adequate institutional capacity, operational systems and liquidity** to develop and manage new financial products: In addition to management capacity, sufficient liquidity is a requirement to grow the portfolio, and although the ACAT can eventually help position an FSP for more financing, loan capital must be available to respond to the new demand and the FSP's agri-lending capacity.

Financial Services Development: Rwanda

Among other efforts to increase access to agricultural finance in Rwanda, STARS worked with its 15 partner POs on three particularly high-impact interventions:

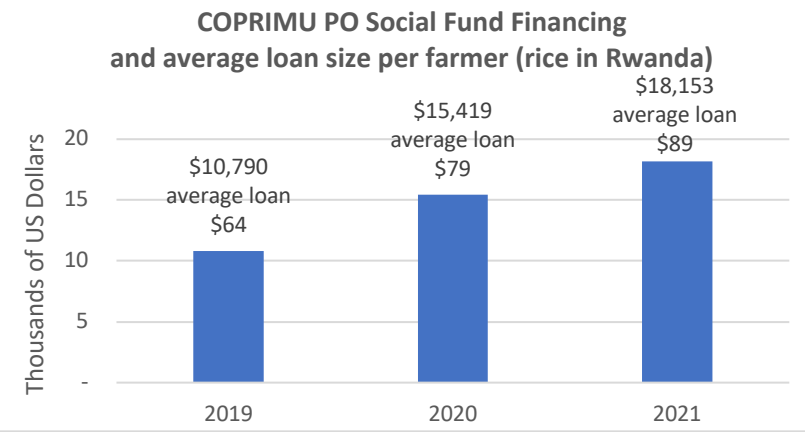
- Establishing PO-managed Social Funds
- Embedding Savings Groups within POs
- Promoting and facilitating access to agricultural insurance

STARS provided technical assistance to POs to develop internal **Social Funds** (also called Emergence Funds) for lending to members. Capitalized through interest-bearing member contributions, as well as PO equity and income, the Social Funds provide a source of loans for PO members of about $5,000 and up. These loans carry a flat monthly interest rate of 2% and a six-month term. Members use the loans for farm activities, as well as to smooth consumption. All 15 of the STARS POs in Rwanda established Social Funds over the course of the project, and this mechanism has supplied members with an accessible and affordable source of credit. (Figure 7 provides an example of one PO's Social Fund loans.)

Figure 7: Rwanda PO Social Fund Financing

Previously, for accessing finance, the MFI (Clecam EJO heza) was only the option, but since 2019 we have an emergence fund. Now we have capital of 4 million Rwf, and we have a target of more than 50 million. Our fund is for saving and credit, where we provide loans to cooperative members at a small interest rate (2% per month).

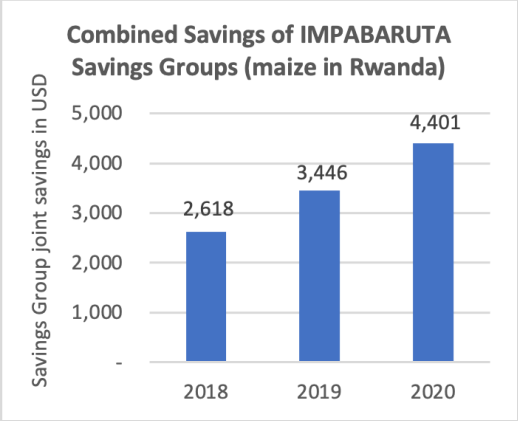
—Maize PO manager, Rwanda

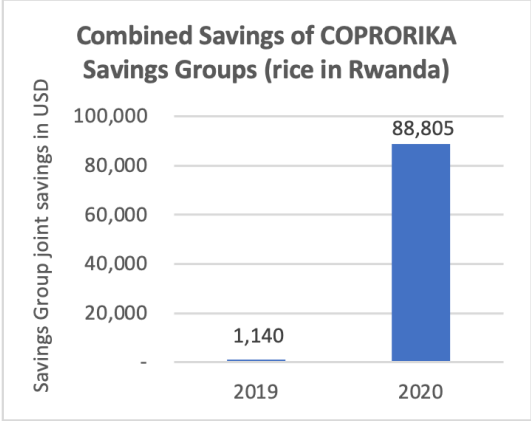


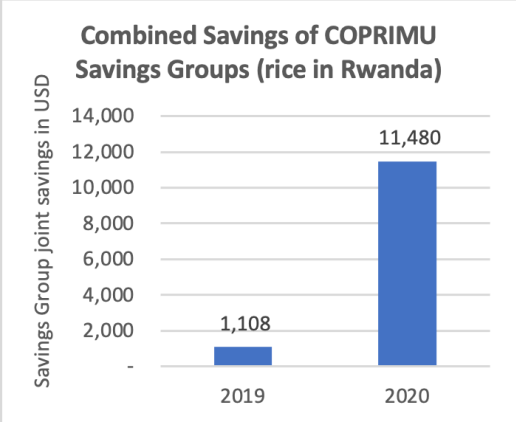
As long as the quantity of production increases by individual farmer, their access to finance will increase also because the cooperative offers a farmer loan based on the quantity of yield, he/she is able to produce each season and how it has been increasing seasonally. —Rice farmer, Rwanda

The program leveraged the organization and shared interests of the cooperative members to promote **Savings Groups** within POs. STARS introduced a basic Savings Group methodology and invited members to form groups for the purpose of saving and making small loans amongst themselves. The savings are held in group savings accounts at local MFIs. Five POs in Rwanda implemented permanent, self-managed, mixed-gender savings groups with an average of 13 members per group. At IMPABARUTA PO (in maize), for example, there are 62 savings groups. (Figure 8 offers snapshots of savings growth at three STARS Rwanda POs.)

Figure 8: Growth of Savings Group Capital in Rwanda







Thanks to STARS training and awareness raising on savings, I realized that my farming income can be invested again to generate more income. So, I grouped the women in my PO into a savings group and we started saving 1 USD per week. From that savings, I was able to buy my tailoring machine and I am now a tailor in my village. My next target is having my own tailor shop so that other tailors can even rent the space from me.

—Abeza Josée,
female maize farmer of Impabaruta PO

STARS also played a valuable role in promoting **agricultural insurance** and supporting POs in obtaining insurance. First, STARS organized workshops for POs with MINAGRI (which subsidizes private insurance by covering about 40% of the cost to encourage adoption) and private insurance companies, in order to introduce agricultural insurance. Rice farmers stand to benefit particularly because of frequent flooding, while maize POs seeking to become seed multipliers are required by RAB to carry insurance. As the STARS program progressed, the strong and productive relationship between STARS and the POs encouraged the POs to trust STARS recommendations and to take up insurance. STARS provided support to its PO partners in preparing insurance applications. (See Figure 9.)

Figure 9: Agricultural Insurance Enrolment Growth at Rwanda PO

Agricultural Insurance at COPRARIKA PO (rice, Rwanda)				
	Season			
	2020B	2021A	2021B	2022A
Premiums paid (USD)	2,445	2,445	3,482	3,482

According to MINAGRI, the role of STARS in facilitating insurance take-up was significant. While figures comparing agricultural insurance adoption among STARS-supported POs with national PO take-up will not be available until 2022, anecdotal reports are that STARS was a strong factor. Insurance renewals remained steady among the POs after enrolment, and at the end of the program in 2021, POs renewed at the same level for the 2022 season—indicating satisfaction with the insurance and sustainability of the intervention.

Gender Balance

Attention to gender balance with the proactive inclusion of women was woven throughout the STARS program and all intervention areas. Below are some instructive examples of practical gender inclusion and their results under STARS.

1. Choice of Value Chain

   ICCO and Mastercard Foundation took gender into account in identifying the VCs on which the STARS program would focus in each country. In Rwanda, the maize VC has a relatively high proportion of women, and in Senegal, cowpea production is dominated by female farmers. By zeroing in on VCs where women were already at least somewhat well represented, STARS was able to amplify the BDS, capacity building, roles and outcomes for female farmers. Similar to selecting POs with a strong existing foundation and room to grow, this approach allowed STARS to take women's VC participation to a new level.

   The example of cowpeas in Senegal illustrates the success of this approach. STARS agricultural market analyses revealed that there was much greater potential in cowpeas than was being realized in Senegal. With STARS interventions—bringing cowpea farmers together with quality input providers, covering the cost of a demonstration farm and training for a small number of farmers, and in two POs the creation of a warrantage system—STARS helped to demonstrate the value of cowpeas and of investing in better inputs and commercialization. With increased revenues from the cowpeas, farmers saw a major increase in their revenues and were able to introduce or set a plan to purchase processing equipment.

   > *The program has impacted our food security because we are now making enough income to be able to buy what we need. In addition, the program has developed a kind of consciousness of our capacity to improve our socioeconomic situation by investing agriculture activities. Now we have understood how the technical aspect impacts the productivity and also how from the productivity we get more revenue that we can use to really apply the technical plan. Now when we participate in meetings with women from other villages around, they tell us that we merit full respect because of our accomplishments and living standard.*
   >
   > —Female cowpea farmer, Senegal

   These VC improvements accrued particularly to women who were already well represented in the VC. Spillover effects included greater confidence among female farmers who began to take pride in their more lucrative farming, and who began to command more respect in their communities. Households also improved their food security from consuming higher quality cowpeas, and applying the better revenues to purchase a more diversified diet (with the female earners able to decide how their earnings are spent and more readily choosing household meal improvements).

2. Participant Quotas

   While STARS worked to elevate VCs with strong female representation, the program also aimed to increase opportunities for women farmers in VCs where they remain underrepresented. Rice in Rwanda and onions in Senegal are examples of such VCs. STARS required that a certain percentage of program participants and beneficiaries be women, and partner POs were obliged to comply. Again, taking Senegal as an example, women had rarely farmed onions. But due to the program quota, the PO and its members had to include women in the FFS, input provision and training.

ICCO trained us on gender balance in our cooperative. After the training we established a gender committee in charge of raising the awareness on gender balance and women empowerment in our cooperative.
During the training and awareness campaign some women shared how accessing finance helped them to improve their farming activities.
It was through these inspirations that many women have the courage to access loans and have also begun to contribute to cooperative leading and decision-making.
—Maize farmer, Rwanda

As a result of their participation, women found onion farming to be possible and profitable, and men realized that women could be capable and successful in a traditionally male-dominated VC. More land was allocated to onions, and more women got involved. Hence STARS' gender quota opened the door both to new income streams for women and to challenging the cultural assumptions that pose barriers for POs and communities to fully realize their production and income potential.

3. Gender-specific Problem-solving

In the extensive upfront analysis of context, gaps and needs, STARS applied a gender lens to ensure that the unique challenges faced by women were surfaced and taken into account in the development of solutions. In Rwanda, in addition to the ineffective, expensive and overuse of pesticides in general, women were hindered when it came to rice production due to the lack of protective gear and the risks of handling pesticide during child-bearing years. The pesticide-spraying BDS that was developed addressed all these issues, including making it possible for women to have their fields sprayed on time. Another example is the introduction of (mixed gender) savings groups, which offer a bridge to formal financial services. This steppingstone is often particularly needed for women, who frequently have little financial education or experience with financial services.

Before ICCO, myself and other old women like me and also pregnant women, we are not able to carry a pump contain pesticides for spraying on the field and we don't have protectives materials (personal protective equipment's) to avoid effect from pesticides, this service were help us a lot and we thank ICCO and our cooperative leaders.
—Rice farmer, Rwanda

4. PO Leadership and BDS Providers

STARS also required that women be represented in PO leadership and decision-making and BDS provision. STARS supported this with training and capacity building to enhance management skills and gender awareness for men as well as women. As more women took up leadership and decision-making roles in the POs to meet program criteria, their confidence increased, and they were able to demonstrate their capacity in new contexts and roles within the community. Not only did women participate in internal PO management and as FFS Facilitators, but they also engaged with VC actors and financial institutions during B2B meetings and exchange visits. At one STARS-supported Senegalese PO (COPAKEL), a woman was even recently elected as the PO President—a definite rarity in the Senegalese agricultural sector.

The increased participation of women has resulted in improvements in quality, productivity and revenue.
—FADEC Nord manager, Senegal

M&E System and Continuous Learning

The STARS Monitoring and Evaluation (M&E) approach evolved over the course of the program. Initially, a robust quasi-experimental, double-difference research design was established with control groups, baseline, end line and extensive quantitative indicators. Informed by the MSD approach underpinning STARS and incorporating DCED standards, the early research methodology sought to measure impacts and program attribution. The research was studded with SCOPEinsight surveys (a proprietary and extensive assessment occurring early in the project and again toward the end), complemented by more frequent monitoring that applied the Kobo tool for VC-related indicators and the (ICCO-developed) Cooperative Assessment Matrix (CAM) tool for financial services indicators. One component of the research entailed

"credit pilot deep dives," whereby several different farmer user cases and pathways to change would be studied and defined. However, halfway through the program, the Monitoring and Evaluation approach was significantly redesigned.

The mid-term evaluation found that STARS' original, elaborate research plan did not correspond well with the adaptive, iterative and gradual program design and implementation. There was tension between program implementation on the one hand, and the research agenda, methods and outputs on the other. Program staff were moving full steam ahead on their path, largely disengaged from the data collection, and STARS partners were dropped and added according to their performance and program opportunities. The hoped-for interchange between quantitative trends and program implementation proved elusive essentially across all the STARS countries. Although the research proceeded best in countries where the staff were particularly curious, ambitious and big picture-driven, and where government interest served to motivate program staff, ICCO and Mastercard Foundation realized that the M&E approach needed to be adjusted to better serve the program.

STARS transformed its MERL (monitoring, evaluation, research and learning) model into PERL: program-embedded reflection and learning. Quantitative surveys and statistical analysis gave way to a program-driven research agenda comprised of a lighter set of indicators (continuing to apply the Kobo and CAM tools), action research on select topics, and a quarterly Plan-Do-Check-Act (PDCA) cycle carried out by the local program teams. The focus was on qualitative research that engaged and made sense to program staff—allowing them to identify relevant questions, carry out inquiries with local stakeholders, suggest studies to the research experts, and actively apply learning to adjust program components during the remaining years of STARS.

STARS found that this new research approach worked well to the extent that local program staff "owned it" and made it work for them. For example, in Rwanda, the team began inviting program partners and stakeholders to quarterly meetings to engage in collaborative analysis and troubleshooting. In Senegal, the program opted to treat the value chain interventions and financial services interventions as separate threads—delving deeply into each area with select staff and stakeholders on a quarterly basis. An investigative journalism approach to documenting STARS program components and anecdotal outcomes proved especially compelling and useful. But in two of the four countries, the program teams did not ever fully embrace or interact with the program research. The final STARS program evaluation, carried out by the same third-party that was involved in earlier STARS research, had to be downscaled to an outcome-harvesting exercise, owing to COVID-19 constraints.

Hence while STARS experimented with varying approaches to research, monitoring and evaluation, the circuitous route, diverse program interventions that evolved over time, and the complicated COVID-19 context during the final years of the program make it difficult to draw clear conclusions about the best approach. One lesson (re)learned is that carrying out even quasi-experimental research on a program that is being designed and altered as it goes along is challenging and probably even incompatible with impact research. Another lesson is the value of identifying human resources that bring a sincerely inquisitive and analytical orientation toward program implementation—and who are genuinely open to critical examination and flexible adaptation of the program activities in response to research findings. A final lesson is the importance of meaningfully engaging program staff in the research questions, design, implementation and analysis—which can help improve the quality of the research, as well as the application of research learnings to the program itself. Although STARS did not land on a magic formula, these lessons will be considered for future programs.

AMEA Tool Highlight

Research and Monitoring of Farmer and PO Capacity: SCOPEinsight Assessments and Kobo-based Questionnaires

STARS employed a variety of tools to measure progress and multifaceted results over the course of the five-year program. Two complementary tools were used to track changes in farmer and PO capacity, including their financial and organizational sophistication, market engagement, production, sales and sustainability:

- **SCOPEinsight (SI) Assessments:** STARS used the proprietary, AMEA-accredited tool SCOPE Basic® to analyze the strengths and weaknesses of POs for the purposes of partner selection, as well as outcomes research. SI tools assess POs along eight dimensions (internal management, financial management, sustainability, operations, market, production base, external risks and enabling environment), with SCOPE-certified assessors collecting data to assign each PO a score from 1 (weak) to 5 (strong) for each dimension. The SI tool offers a standardized approach to measuring and comparing farmer organizations' capacity both currently and from a historical perspective (data from recent years). Each assessment entails an extensive process carried out by a SCOPE-certified assessor, who populates the SCOPE App from which an automatic report is generated. STARS undertook two SI assessments: one early in the program (2016-2017), which informed partner selection while also serving as a form of baseline study, and one toward the end of the program (2020).

- **STARS Kobo-based Questionnaires:** Using the KoBoToolbox suite of open-source software as a technical platform for data collection and report creation, STARS designed a tool for regular, lighter monitoring of partner POs and the VCs in which they operate (referred to in this case study as the STARS "Kobo tool"). The STARS Kobo tool enables assessors to rapidly collect data and assemble reports on the functioning of a given VC and the actual performance of the PO at a point in time. The Kobo tool was designed by a STARS consultant to closely track the program results chain and measure progress against specific goals, such as tons of product sold, number of female PO members and leaders, and number of farmers receiving a loan. Since it is customized and administered by program consultants, the Kobo tool can be tailored to include new program-driven questions and can be rapidly repeated when data appear inconsistent or insufficient. STARS carried out annual Kobo-based questionnaires with POs, as well as other VC actors, from 2017 through 2020.

Uses, Strengths and Weaknesses of Two Complementary Tools (as observed in STARS program)

Assessment Area	SCOPE Basic	Kobo tool
Partner selection	When the STARS team conducted a pre-selection of POs based on a quick scan, and where assessments were carried out by a single, skilled assessor/team, SI was effective at zeroing in on standardized comparison measures for informing partner selection.	STARS did not use the Kobo tool for partner selection, but such a use could be envisioned. Kobo could also be useful for a well-rounded assessment of an overall VC and its actors.
Technical assistance needs	Provides detailed insight in the level of professionalism of the organization according to SI's 8 dimensions. This offers insight into risks affecting the PO's market readiness, credit worthiness and growth potential, and can help identify appropriate TA interventions for capacity building. However, a PO's capacity or potential is not necessarily borne out in its performance, for a variety of reasons.	Does not zero in on strengths and weaknesses of different organizational areas, but focuses primarily on current performance—actual production, sales, access to finance. TA interventions can be designed in response to underperformance, but the tool is less specific about the organizational capacity levers for improvement or to gauge capacity.

AMEA Tool Highlight

Research and Monitoring of Farmer and PO Capacity: SCOPEinsight Assessments and Kobo-based Questionnaires *(continued)*

Assessment Area	SCOPE Basic	Kobo tool
Results measurement	The SI tool can be used to set results targets and monitor progress toward their achievement. At times under STARS, though, the scores did not match actual capacities—e.g., some POs had high financial management scores, yet could not produce basic financial reports; some high-scoring POs did not perform well and vice versa. Since: (a) SI focused on capacity and past performance, (b) assessments are subjectively made by assessors, and (c) the standardized scoring algorithms over- or under-emphasized certain indicators, outcomes were not always aligned with expectations in STARS.[3]	The Kobo tool can also be used to set results targets and monitor progress toward their achievement. STARS designed the Kobo tool to monitor results at the PO level, as well as farmer level and VC level. Measures impact on supply and sales flows within a specific value chain, but less equipped to compare across different value chains.
Reports	SI reports are in-depth, often 60-page documents that follow a standard template consolidating scores and qualitative findings. The reports cover each of the 8 dimensions, according to the assessor's inputs. In theory, the reports should be comparable from one time period to the next. (Note: In the case of STARS, the SCOPE Basic tool was revised between the two assessments, rendering impossible a reliable/meaningful comparison of scores from the beginning to the end of the project.)	Kobo reports are tailored to program results chains and provide data such as gender-disaggregated, farmer-level land-holdings, proportion of production sold versus consumed, source of inputs, source of credit, involvement in warehousing and annual gross income, as well as PO-level data points such as membership composition, sales and provision of embedded services (such as GAP training and credit facilitation).
Tool's quality control, follow-up and querying	Quality depends on the assessor and an SI-contracted Quality Controller, and questions about discrepancies or data gaps are difficult to address. There is a dashboard for pre-programmed queries, but it does require skill/experience to manipulate.	Quality depends on the user's questionnaire and the quality of data collection. The user can readily adjust the tool or repeat data collection when needed. Requires a skilled research director/tool designer who is able to translate data needs to field-level actors and transform field data into meaningful management reports.
Tool's reliability	Assessment reliability is dependent on the assessor's skill and qualitative opinion. As with any tool, garbage in = garbage out. No matter how well-honed the tool is, it is only as useful as the human resources that apply it to collect thorough data, conduct and document thoughtful analyses.	

[3] Note that SI assessment tools have evolved since the STARS program, partly in direct response to learning and experience through STARS. New functionality includes tools for facilitating access to finance. For more information, please see: https://agra.org/wp-content/uploads/2021/02/Mobilizing-agricultural-finance-2021-02.pdf

Effective and Sustainable Market System Changes

The foregoing sections have presented select STARS interventions, how they were designed and implemented, and their outcomes for POs, farmers, VC development and financial access. But as a MSD program, STARS aimed to stimulate market systems change.

> *In our cooperative, BDS providers continue to work after the end of STARS Program because they have been approved by the Cooperative General Assembly, and the budget for paying services delivered by them was settled and approved by General Assembly as well. As long as the productivity increases, the number of BDS providers will also increase from 6 to 10.*
>
> —Maize cooperative president, Rwanda

This chapter considers the key market actors in exploring whether and how STARS catalyzed positive market changes and momentum that will continue to benefit POs and farmers following the end of the program. How were the different market actors influenced by the STARS program interventions? What are these actors doing differently now than before STARS and why? Figure 10 highlights evidence of changes in stakeholder behavior across the VCs supported by STARS in the two countries. As a result of these apparent market system changes, many of the STARS interventions appear scalable within the VCs that STARS supported in Rwanda and Senegal—they are poised to continue expanding their reach beyond the original farmers, POs and perhaps VCs to achieve much bigger scale without further program investment.

Figure 10: Evidence of Market System Shifts by Actor

Market Actor	New Behaviors: Rwanda	New Behaviors: Senegal
Smallholder farmers (PO members)	• Access ag training and extension advice nearby, rapidly and regularly; place value on ag extension and vote to pay for it (FFS Facilitators) through their POs • Rarely need to seek bank loans, as they pool savings to lend amongst themselves for small needs, and can access loans readily from their PO social funds • Take pride in being certified seed multipliers and pursuing a new line of farm business • Have adopted a new market-oriented view of agriculture as a commercial activity, rather than merely subsistence	• Apply their new appreciation for quality inputs by identifying, demanding and investing in quality seeds and bio fertilizer • Surprised by the increase in crop production and quality that can be achieved, they are bringing a more entrepreneurial outlook to seek out new income streams in the same as well as new VCs (e.g., horticulture) • Perceive and are motivated by the new-found value of cowpea • See female farmers and decision-makers in a new and positive light
Producers' organiz-ations (cooper-atives)	• View VC organization and coordination as essential (e.g., selecting identical seed, planting, spraying, harvesting in unison to maximize harvests, quality and timeliness) • Take a more business-minded and autonomous approach to paying for inputs and FFS Facilitator support, setting and pursing business and action plans • Maximize harvest by using the Harvest Tracking Approach to estimate PO crop • Provide loans to members using their own funds instead of waiting for FSP loans—capacity building enabled them to manage and grow their Social Funds • View women as serious farmers and leaders	• Setting their own prices, as they operate from a completely different position in market negotiations, thanks to the warrantage system that gives them bargaining power • Respond to high-profile public sector and NGO calls for proposals and win contracts for large and sustained production volumes • View women as serious farmers and leaders • Have become seed multipliers, thereby adding a new role in the VC as input suppliers as well as producers

	• Have become seed multipliers, thereby adding a new role in the VC as input suppliers as well as producers • The Federation of rice POs is extending the FFS Facilitator and BDS spraying services throughout its network of POs nationwide	
Input providers	• Can now source more local seed by purchasing from STARS PO seed multipliers for on-selling, thereby reducing costs and contributing to national goal of reducing seed imports • See increase in business thanks to B2B linkages with POs seeking to buy quality seed in bulk on ongoing basis • Finding new distribution channels by selling wholesale to POs that have become agro-dealers	• Instead of only selling to individuals in the market, they now work through POs to distribute—ensuring more volume and business stability • Maintain commercial relationships with POs and groups of farmers, including contracts and input credit
Off takers, processors, market traders	• Satisfied with production and quality increases that keep their own output high, and realizing the high potential, processors see value in paying for pesticide spray for POs to use in their coordinated BDS spray service • Growing trust in and business relationships with POs has led off takers to give rice to PO farmers on credit during the hungry season, repaid in cash at harvest time	• Experiencing less power in price negotiations with POs that have substantially raised quality, obtained bank backing for farmer payouts, and are no longer desperate to sell at low prices • Accessing higher quality product and larger volumes, making their collection more efficient and increasing revenues (if not always profits) • Bigger off takers and international off takers (e.g., from Mauritania) attracted by the volumes and organization of POs are seeking out trade opportunities with POs • NGOs and public sector are off takers are attracted to the quality and quantity of PO production (cowpeas)
Financial Service Providers	• Banks and other FSPs are seeking out POs; COPRORIKA for example has been approached by FSPs wanting to provide them with financing • MFIs have expanded agricultural portfolio and products and are more confident about ag finance than ever thanks to the A-CAT • SACCOs are seeing an increase in female and farmer clients as STARS-promoted savings groups bank with them and "graduate" to formal financial services	• Commercial banks like LCA are providing commercialization loans to POs working in a previously low-value, primarily women's VC (cowpea) • MFIs have expanded agricultural portfolio and products and are more confident about ag finance than ever thanks to the A-CAT • FSPs are able to reach new clients and rural areas while facing lower risk by serving POs with business plans, new markets and rising income
Public Sector	• Developed a linkage to STARS POs producing certified rice seeds in order to increase access to more volume and high-quality seeds for social distribution. Food security and better income also. • Satisfied with indications that POs can contribute to better food security as well as improve the rural economy thanks to higher production and revenues • Realizing reduced rice and seed imports, thereby contributing to national goals	• Now buys certified, improved seed from STARS POs to give to low-income populations to raise production (government agency ISRA cannot produce enough, and the seed is lower quality, so POs provide a new source and doubles production) • Satisfied with indications that POs can contribute to better food security as well as improve the rural economy thanks to higher production and revenues

As Figure 10 demonstrates, the STARS program interventions appear to be associated with a wide variety of changes—small and large—across VC market actors in Rwanda and Senegal. This evidence suggests that STARS has been successful at setting in motion new behaviors and activities. Many of these behaviors show signs of being sustainable and scalable—actions are already being carried forward in their respective VCs to reach more farmers, continue increasing PO revenues and bankability, and improve rural economic resilience without additional program investment.

Replicating these approaches in different VCs within the two countries also appears feasible, for example by transferring FFS, warrantage, ACAT and HTA to federations of POs working in potatoes, millet and other crops. Such replication will require strong leadership, communications and technical skill to achieve the transfer, and this will necessitate some level of investment to achieve (whether in-kind by a public agency, or with technical capacity building investment by donors). Finally, the examples, evidence and lessons presented in the case study support the case for public and private sector actors, donors and investors to pursue replication by investing in new collaborations that build on STARS successes and lessons learned in other sub-Saharan African countries and VCs.

Conclusions

With the STARS program interventions and evidence of market system changes in mind, this chapter summarizes the key lessons learned and provides some recommendations for AMEA members, Cordaid, the ICCO teams in Rwanda and Senegal, and others considering future investments and programming in agricultural VC development.

Lessons Learned

1. What lessons can we glean from STARS on **Partner Selection**?
   As in any donor-funded development program or business initiative, the right choice of partners makes all the difference. Based on STARS' experience, here are some suggestions for selecting POs to engage in similar initiatives:

- **Aim for the middle:** Based on SCOPEinsight and other capacity assessments, STARS selected POs that had a solid enough foundation to make progress over the life of the project, but plenty of room to grow. This also applies to PO size; work with partners that are large enough to reach a significant number of farmers and attain demonstrable scale, but not so large that they are unwieldy and slow to integrate new processes, approaches and activities. In contexts like Senegal, POs that also run an MFI are more likely to have staff and financial management skills, allowing for more capacity for progress, but there are trade-offs in terms of capacity building needs.
- **Seek motivated and entrepreneurial partners:** The project staff and PO partners that showed up with an inquisitive and experimental mindset, and an intrinsic motivation to roll up their sleeves and solve problems led to the best results. When the STARS program directed more BDS time and effort toward the POs that demonstrated resourcefulness and results ownership, program staff found that some partners soared, while others fell by the wayside. Sound out partners' motivation, seek evidence of vision and initiative in the past, make sure they are willing and able to contribute to program expenses, and hold all parties accountable for results.
- **Avoid sustainability-undermining overreach:** For long-term partnerships among local actors, bring potential partners together, but let the selection decisions fall to the market actors themselves. STARS scanned the market for POs, input suppliers, off takers, FSPs and other potential partners, and then played a vital role in bringing them together for "B2B" meetings and events. But STARS took care not to dictate partner selection for the POs. By introducing potential partners and then supporting negotiations where needed, STARS put the local actors in the driver's seat to build their own relationships from the outset.

2. What learning can we draw from STARS on **Farm Production Enhancement**?

- **Decentralized, self-sustaining networks of BDS providers:** The Rwanda model of POs managing Farmer Field Schools with a decentralized network of member-nominated facilitators receiving stipends appears to be a valuable and sustainable approach in the right context. It worked well to have STARS (donor support) pay for the FFS, the facilitators and BDS (pesticide spraying) to get the system up and running. But POs quickly perceived the value created by this model and were willing to allocate some of their budget to drive higher income generation. In a well structured and high-capacity VC like rice in Rwanda, this decentralized model saw rapid take-up and replication—which could be extended to other VCs in Rwanda, as well adapted to work in other countries with comparable contexts.
- **Power of demonstration**: STARS reconfirmed the usefulness of investing enough in the ingredients (and time) necessary to show the potential of a given VC, as a way to convince local actors that their own investment is worthwhile and will be rewarded. Farmer field schools combined with inputs, GAP support, uniting market actors, and the time needed to set this up and observe results led to marked shifts in the Senegalese cowpea VC, for example. Although the upfront donor investment can be steep, if done right, demonstration can effectively stimulate markets and lead to self-sustaining change. The maxim of "seeing is believing" was validated through STARS and should not be underestimated in future VC development projects.
- **Exit strategy and Design with the End in Mind:** Build in sustainability from the outset by identifying the actors and incentives that will take over the long-term BDS and market roles needed to maintain the new system. In countries and interventions where STARS played a temporary capacity building role with a view to how the market would assume the reins for the long-term services needed, the program achieved better outcomes and appears more likely to continue now that STARS has ended. Making sure that the program team and partners are oriented toward establishing win-win engagements is one element of this. By designing the solutions in close collaboration with local farmers, POs, input providers, processors and other VC actors, and program staff, stakeholders own the approach from the beginning, bring their unique perspectives to the table to develop appropriate solutions, and are better equipped to carry the activities forward without program support.

3. What lessons learned does STARS offer on **Market Linkages**?

- **Simplicity:** Don't underestimate the power of merely bringing actors together, introducing them, letting them self-select and form agreements. Stimulating partnerships was invaluable under STARS. Disparate farmers lacked the knowledge, conviction, market power or confidence to find input suppliers, off takers, financial and other partners; meanwhile, input suppliers, off takers, FSPs and other market actors had no efficient way to reach and work with smallholders and even POs. The simple act of identifying potential partners, grouping them and uniting them was often enough in STARS to forge commercial relationships that are valuable for all.
- **Groups as platforms:** Grouping farmers and helping to structure and organize their decentralized management is key. In rural settings, cooperation among small actors provides a platform for accessing all kinds of services and benefits, and operational POs are a foundation for farmer market insertion.
- **Think public and private:** Private sector actors are of course high-priority for shifting market systems. But public sector opportunities can also be important sources of revenue as well as capacity building. In Senegal, STARS sensitized some POs to the value of public sector tenders and built their capacity to respond to calls for proposals, leading to profitable contracts that also offer a social bottom line. There are good linkage opportunities in public and NGO markets, and these also call for and reinforce organizational and management capacity.

4. What conclusions can we point to for **PO capacity building**?

- **PO database prerequisites:** As mentioned above, POs need to be able to track their members' farms and production. A PO database is essential both to improve bankability and to establish

commercial linkages. In Rwanda, the POs leverage their decentralized structure of small groups and their FFS Facilitators to collect data in the field by hand, feed it up to the district level and then the PO, where the data is entered into Excel spreadsheets for management purposes. In order for a database to be functional, the PO's communication systems and management mechanisms must be reliable. Therefore, technical assistance for process design and training on Excel usage and analysis, data storage and maintenance are prerequisites for a PO database. Without efficient and effective processes in place, investments in high-tech, like tablets and mobile apps are moot.

- **PO leadership counts:** PO leaders need to be elected for their vision and motivation, rather than for clout. The most successful STARS partners were POs led by managers seeking to develop markets, rather than wait for them to come, and willing to invest a portion of earnings to multiply production instead of waiting for donor hand-outs. This goes back to partner selection, but also argues for similar programs to plan on providing coaching and technical support to enhance leadership and management skills.

5. What can we say about **Financial Services development** lessons from STARS?

- **Expanding options:** Farmers and POs need more options for managing their capital and investments. Programs can spur market change by working simultaneously on the supply side and the demand side. On the supply side: familiarize FSPs with agricultural finance and specific VCs, help them gauge and manage risk more efficiently and effectively, and provide technical support for the design and testing of new financial products. On the demand side: provide financial education for POs and farmers, broaden awareness and options for formal and self-managed savings, borrowing, input credit, etc.
- **Again, grouping is key:** In rural areas, farmers can be dispersed and not well connected to one another and to markets. Finding and implementing mechanisms to bring them together—whether digitally, via in-person B2B meetings, through improved cooperative management, or other means—can improve the visibility of VC actors, their bargaining position, accessing market, the efficiency and viability of serving them in rural areas and with low collateral, and the diffusion of production-raising GAPs, financing options and other lessons learned.

6. What conclusions can we state about **women's inclusion** in agricultural VCs?

- It is well established that achieving better gender balance and greater participation of women in decision-making and income-generating activities requires overcoming major cultural, traditional and logistical hurdles.
- STARS set a specific quota for women's participation, and POs had to comply to participate. This appears to have forced the inclusion of women in PO leadership roles, as well as farm-level activities--which led to some changed perspectives among men as well as women. Making women's inclusion a condition of the donor-funded program thus seems to have added value.
- In Senegal, the "low-value" cowpea VC relegated to women was suddenly recognized as a high-potential crop. The value of onions led to an expansion of cultivated areas, requiring women to plant and manage a portion—which has demonstrated that women can play a vital role in a serious VC. By proactively selecting some VCs that already had relatively strong female representation, STARS was able to take women's roles and income to a new level, enhance their confidence and respect within the community, and hopefully pave the way to new opportunities for female farmers.
- In both countries, women's participation in PO management demonstrated to both men and women the capability of women to contribute positively to decision-making and enhanced women's confidence in their ability to lead and participate actively in agricultural production and income generation. Replicators should actively promote women's representation in leadership, while also providing training and skills to bolster their performance in these roles.

Considering that the STARS investment over five years and across four countries amounted to about $90 per farmer reached, the value for money proposition of STARS is quite strong. In addition to the improved

access to finance and increased production and revenues of individual farms, numerous market actors have shifted their customer focus to include smallholder farmers and overlooked POs, and a host of valuable lessons have been culled to advance PO capacity building, VC development and agricultural finance. By learning from the STARS experience, public and private sector actors can further leverage the program investment to achieve higher levels of outreach, impact and value for money.

Recommendations

In addition to the recommendation that AMEA members, Cordaid/ICCO and others integrate and act on the lessons learned presented above, the authors present the following recommendations.

Rwanda-specific

- The example of the Rwanda Rice Federation's scaling-up of decentralized and self-sustaining BDS (FFS Facilitators and pesticide spraying) can be replicated in other well organized federations such as maize and Irish potatoes.
- A public-private partnership in Rwanda could draw on the example of STARS and transfer knowledge, skills and tools to stimulate market change and smallholder engagement in other agricultural VCs. This could take the form of a government-driven initiative to replicate select STARS interventions in new VCs with technical assistance from experienced development practitioners and the participation of private sector actors.
- Explore feeding into the government and Ministry of Agriculture's emphasis on youth in agribusiness and the digital economy to employ a similar program strategy focused on youth agricultural and rural livelihoods, integrating youth into POs, and empowering youth to modernize farming.

Senegal-specific

- A PO database is crucial for building the capacity and market linkages of Senegalese POs. However, the foundation for such a database and its creation and maintenance does not yet exist. Asked about the need for a PO database, POs and BDS providers tend to focus on the technology, whereas the current structure and operations of the POs do not appear ready to deploy the ongoing data collection process necessary to sustain a meaningful database. For this reason, several interim steps are recommended.
- Facilitating exchange visits for POs to learn the potential of well-functioning agricultural cooperatives and decentralized management has the potential to influence further market change. Such exchanges could be within Senegal (for example visits to COPAKEL), Rwanda and/or elsewhere. Senegalese POs that understand what works for tiered and systematized data collection, agricultural extension provision and other business services will be better able to envision and affect change within their associations, cooperatives and communities. Farmers and POs have the potential to alter the local dynamic and influence the government in supporting PO growth, organization and development in Senegal.
- The decentralization of the Ministry of Agriculture presents a new opportunity for further developing PO capacities. Farmer associations can now more easily apply to become a formal cooperative (PO) in Senegal. Technical assistance at the Ministry level to highlight STARS learning and inspire a cascading of lessons and approaches could help scale-up market shifts and replicate them in new VCs. Further, providing technical and operational capacity building for newly formalized POs would be a valuable investment for increasing smallholder market linkages and access to finance. Whether provided by a public agency with Training of Trainer-type support from a private entity, or undertaken through the private sector, capacity building should include establishing leadership, systems, processes and data collection and management for tracking farmer production.
- The warrantage system would be promising for millet. Consider investing in a similar capacity building initiative to support the millet VC in adopting this model.

- Warehouse space is key in the success of warrantage; owning rather than renting a warehouse offers more value. (FADEC Nord's warehouse is rented, whereas COPAKEL owns their warehouse and therefore reaps more income.) Consider providing TA to POs in the cowpea (and potentially millet) VC to qualify for asset financing, helping POs demonstrate their bankability to FSPs, uniting POs and FSPs to explore financing arrangements for this purpose, and helping POs bring input suppliers to the table to enhance the warrantage scheme with quality seeds and fertilizer.
- In future such programming, set a clear action plan with the POs and monitor it. Although STARS consultants prepared business plans with or on behalf of POs, without accountability and technical assistance, the POs are not utilizing their business plans. Further support is needed on understanding the application of business plans and implementing action plans to pursue financing and investment, rather than waiting for the "business plans to be funded," as some POs indicated they are doing since STARS ended. Consider a "moral contract" between POs and the organization assisting them, and be sure to galvanize the PO members to select motivated leaders and to hold their leadership accountable.

<u>For replication and the sector generally</u>

- Based on the high rate of success of many STARS interventions and the rich learning, we recommend that AMEA, Cordaid and other donors, public agencies and stakeholders build on the STARS experience by promoting holistic interventions that bring together increases in farm production, market linkages, PO capacity building, financial services, as well as gender inclusion and continuous learning to influence market system development. Ministries and other public sector actors—especially but not only those in the STARS countries—can leverage STARS by introducing examples, approaches, tools and lessons learned to other VCs. By emphasizing the demonstrated business case for POs to implement decentralized FFS, test improved seeds and GAPs, track harvests and invest in warehousing, public and private stakeholders may be able to inspire local public and private sector stakeholders, as well functioning VCs themselves, to invest in and institute new practices.

- We propose that AMEA, Cordaid and others test and communicate about research approaches that engage program staff from the outset—in framing the research, embedding it into the program management, and even collecting the data and input needed to draw conclusions. Program staff need to be highly invested in the questions and prepared to make program adjustments in response to research. Our sector needs solid strategies for improving collaboration between research experts and program implementers, including bridging communication about research questions, methodologies and application to end results.

- Human resources are central to everything from market assessment and partner selection to successful skills transfer and problem-solving, and from research design and data collection to communication and replication of results. While this is not a new observation, it is important to underscore that success hinges on the technical team. In scaling up and replicating STARS-style interventions, practitioners should emphasize knowledge, skills, attitude and experience, while also reinforcing organizational culture, actions and incentives around a growth mindset. Having the freedom to explore, test, inquire, demonstrate creative ownership, make course corrections and probe for learning can go much further than insisting that staff follow instructions and deliver results.

- We recommend that Cordaid continue to track the sustainability, scalability and evolution of the specific key STARS components and market systems changes described in this document and in all four STARS countries. Tracking their trajectory and sustainability for several years beyond the life of the STARS program would provide valuable information to Cordaid, AMEA, program donors and the development sector more broadly for future programming.

Annexes

A. Bibliography

B. Detailed Research Methodology and Informants

C. Sample STARS Capacity Building Plans, Curricula and Tools

Please see separate zip file containing annexes.