

SUSTAINING INNOVATION IN RURAL DEVELOPMENT

CORDAID'S HOLISTIC MSD APPROACH EXPLAINED THROUGH THE STARS PROGRAM

PUBLISHED BY CORDAID AND ROYAL TROPICAL INSTITUTE KIT (AMSTERDAM)
2021

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1. ACKNOWLEDGEMENTS

The main authors of this paper Fred Zaal (Associate Advisor at Royal Tropical Institute (KIT)), Amsterdam, Liz Stones (Technical PERL Advisor to STARS), and Wouter van Bruggen (Cordaid) wish to thank the following contributors and advisors:

Karin Rozendal (STARS) was responsible for communication between the authors, STARS teams and STARS management in the writing process. Helena Posthumus was project leader of the STARS impact assessment in 2020-2021, and provided insights and recommendations to refine this paper. Maurice Koppes, the STARS programme manager, supported the process from start to finish.

This Working Paper, and the innovations which inform it, would not have been possible without the STARS teams in Rwanda, Ethiopia, Burkina Faso and Senegal. We are grateful to Patrick Birasa (Rwanda), Idrissa Ba (Senegal), Lassina Sanou (Burkina Faso) and Desta Damena Heyi (Ethiopia) who identified and contributed the case studies. Data and insights presented in this Working Paper were partly derived from the impact assessment final report authored by Fred Zaal, Anne Rappoldt (KIT), Désiré Mushumba (Consultant Rwanda), Issa Bass (Consultant Senegal), and Helena Posthumus (KIT). Evidence presented in this paper is derived from the Impact Assessment of the STARS programme implemented by the Royal Tropical Institute (KIT) Amsterdam in the period 2017-2021, various STARS internal publications and monitoring data, and supplemented by the contributions of the national STARS teams.¹

¹ See Zaal *et al* (2021) Evaluation of the Strengthening African Rural Smallholders (STARS) programme (2016-2021). STARS evaluation - Final Report. Royal Tropical Institute (KIT), Amsterdam

2. ACRONYMS

AAER	Adopt-Adapt-Expand-Respond model (also AA ER model)
A-CAT	Agri-Credit Assessment Tool
A2F	Access to finance
BDS	Business Development Services
CIR	Cadre Intégré Renforcé
DANIDA	Danish International Development Agency
EIAR	Ethiopian Institute of Agricultural Research
EU	European Union
FCFA	West-African Franc (Franc CFA)
FFS	Farmer Field Schools
FNBS	National Federation of Bakers (Senegal)
FSCs	Farm Service Centres
GAP	Good Agricultural Practices
GIZ	German International Development Cooperation
ICCO	Inter-Church Coordination Committee (Since 2021 Cordaid)
kg/ha	Kilogram per hectare
KIT	Royal Tropical Institute / Koninklijk Instituut voor de Tropen
M4P	Making Markets work for the Poor
MFI	Micro-Finance Institutions
MSD	Market System Development
MT	metric ton
NGO	Non-Governmental Organisation
OH	Outcome Harvesting
PERL	Programme-Embedded Reflection and Learning
PO	Producer Organisation/cooperation
SACCO	Savings and Credit Cooperative Organizations
STARS	Strengthening African Rural Smallholders
ToC	Theory of Change
ToT	Training of Trainers
USD	United States Dollar
VC	Value Chain

3. INTRODUCTION

This Working Paper aims to describe and analyse the approach to innovation adopted by the STARS programme, presenting case studies across diverse value chains in four country contexts. Building on robust underpinning Market Systems Development (MSD) frameworks, the STARS programme catalysed diverse innovations affecting a wide range of stakeholders, while keeping smallholder farmers firmly at the heart of the intervention.

This paper first provides an overview of the scope, scale and approach of the STARS programme, and the core pillars on which it was developed. Next, the paper introduces the underpinning theoretical models through which the selected innovations are analysed: AAER and the MSD doughnut. These frameworks are then used as a lens to structure and analyse the case studies.

This collection of case studies was selected and presented by the STARS teams in each of the intervention countries through a participatory approach; ensuring that their voices are heard at this final stage of the programme. The case studies are a source of pride for the STARS teams, and were chosen to showcase powerful or unusual examples of the innovations piloted by STARS which were subsequently owned and transformed by the stakeholders and target groups across these diverse settings. These selected case studies are listed in Table 1.

In this Working Paper, the case studies are presented systematically according to the structure of the MSD doughnut; from innovations targeting the supporting functions of the core market mechanism of supply and demand, through to those influencing the underpinning standards, regulations, laws, informal rules and norms. Each case study is explored through the lens of the AAER framework, assessing the extent to which the core actors and surrounding ecosystems have adopted, adapted, expanded and responded to these innovations to embed them within systemic structures and processes, and maximise their sustainability and impact.

Finally, the paper concludes with reflections on the operational and theoretical insights and lessons learned through implementing these innovations and catalysing processes of systemic change in Ethiopia, Rwanda, Senegal and Burkina Faso.

4. THE STARS PROGRAMME

The **Strengthening African Rural Smallholders (STARS)** programme was implemented over a five-year period (2017–2021) by ICCO cooperation (now Cordaid) in partnership with Mastercard Foundation. The programme focused on improving access to finance and markets for more than 200,000 smallholder farmers in Ethiopia, Rwanda, Senegal and Burkina Faso. In each of these countries, interventions were focused on two key value chains:

Country	Core target value chain	Selected case studies
Ethiopia	Malt barley Potatoes	Boosting inputs for the potato value chain Facilitating collaboration for improved malt barley production
Rwanda	Maize Rice	Enhancing strategic and operational risk management for MFIs Enhancing women's representation in PO management structures
Senegal	Cowpeas Onions	Establishing warrantage systems Transforming cowpea to flour Improving cowpea seed multiplication Financing solar innovation
Burkina Faso	Shea Sesame	Establishing sustainable Business Development Services Training Trainers to embed sustainable skills

STARS sought to identify and address key challenges faced by stakeholders, in particular smallholder farmers, across these value chains in order to promote agricultural development and catalyse inclusive economic growth. The STARS strategy was based on two core pillars: Access to Finance (A2F) and Value Chain Development, with Programme-Embedded Reflection and Learning (PERL) as a firm foundation.

4.1 Access to finance

Smallholders require access to adequate finance to secure quality and timely inputs for production, processing and transportation. The lack of financial service providers that provide loans tailored to their needs, is one of the smallholder's main constraints to improving the quality and quantity of their production. Aiming to support improved access to finance, STARS partnered with 22 MFIs to develop innovative, crop-specific financial products for smallholder farmers. In addition, STARS developed the capacity of MFIs to enhance their risk management, business planning and business plan development and capitalization through deposit mobilization and national and international refinance. One of STARS' major A2F innovations, initiated in all four countries, was introducing MFIs to the A-CAT tool and supporting its institutionalization. The A-CAT tool enables both farmers and MFI loan officers to systematically develop an inventory of the inputs needed for a certain crop, adapted for the area that the farmer intends to farm, as well as facilitating financial planning for disbursements and repayments.

Implementation of this and all other A2F innovations and measures was contextually specific to ensure and embed sustainability, but the underpinning principle was to promote financial products tailored to the needs of the farmers (both women and men) and the crop, rather than generic finance products such as general purpose loans.

4.2 Value Chain Development

STARS worked to improve smallholder farmers' agricultural skills and their position within the value chain. While some of STARS' innovations targeted farmers directly, Producer Organizations (POs) were STARS preferred partners. After an initial rigorous and systematic assessment of priority needs and existing capacities, STARS subsequently supported POs in capacity

development, building skills in (financial) management, business planning, accessing markets and enhancing their capacity to support smallholder farmers. Examples of value chain development activities by STARS include training POs in fee-based agri-service provision to members; linking POs to offtakers such as processors; and establishing market linkages between POs and improved seed providers.

This Working Paper aims to explore the opportunities provided by the MSD approach, as adopted by STARS, in achieving innovative and sustainable improvements in rural lives and livelihoods. It presents some of the innovations implemented, and reflects upon the opportunities, challenges, best practices and lessons learned during this MSD intervention.²



² <https://www.icco-cooperation.org/en/project/stars/>

5. MARKET SYSTEM DEVELOPMENT – THEORETICAL FRAMEWORK

STARS adopted an MSD approach³ to generate significant and lasting impact for smallholder farmers and other stakeholders. The MSD approach focused on multiple levels of intervention: from finance to input development and provision, to production training in the field using Farmer Field School (FFS) models, to improving market conditions by linking farmers and their POs to the right market actors, large processors and clients.

Two frameworks are introduced in this Working Paper: the AAER Framework and the MSD Doughnut. The table below summarises: 1) What the theory addresses, 2) Why it is relevant in this Working Paper, and 3) How we use it to inform our analysis of the STARS innovations.

Table 2 » Explaining and comparing the theoretical models		
	AAER Framework	MSD Doughnut
What	An analytical lens to understand how innovations piloted in target markets contribute to broader systemic change.	Describes the core economic transaction and its relationship with underpinning rules and functions in market systems.
Why	AAER provides a structured approach to understanding and measuring the sustainability of innovations and the extent to which systemic change has been catalysed.	The MSD doughnut portrays and systematically lays out the key components which shape the exchanges of goods and services at the heart of market systems.
How	We use the AAER model to structure and categorise the analysis of the systemic processes and the extent to which the sustainability of the innovations described in each case study has been institutionalised through the Adopt, Adapt, Expand and Respond framework.	We use the core levels and sub-components of the MSD doughnut to categorise the selected innovations presented in case studies; from contributing to the supporting functions through to intervening to enhance underpinning rules to empower smallholder farmers to benefit from market systems.

5.1. AAER Framework

The STARS programme aimed to catalyse sustainable and systemic transformations within market systems by introducing relevant, accessible, affordable innovations which could be adopted and owned by the relevant stakeholders; from smallholder farmers and POs to MFIs and agri-input providers. The Adopt-Adapt-Expand-Respond (AAER) framework provides a useful model through which to assess the effectiveness and potential impact and sustainability of these innovations, and each case study presented in this Working Paper is therefore structured according to these four components.

The AAER framework was developed as a precise, coherent and consistent mechanism through which to analyse, understand and evaluate systemic change. The model comprises four core components through which development interventions can be evaluated, providing four layers or levels of systemic, inclusive and sustainable change in the target market systems. The table below summarises the four core components of the AAER model:

³ <https://beamexchange.org/market-systems/what-market-system/>

Adopt	Adopt refers to the level of ownership (the internal acceptance, incorporation and institutionalisation) of the new behaviours or practices by the development partner. In the case of STARS, this could relate to the extent to which a farmer, MFI or PO is absorbing and using the innovation, changing their behaviour and adapting their practice accordingly, e.g. in the internal policy statements of target organisations.
Adapt	Adaptation refers to the ways in which other stakeholders or actors within the wider system respond to these behavioural changes of the target development partner. In the case of STARS, this could relate to the extent that other farmers or institutions accept the behavioural changes and new practices, e.g. PO members' acceptance of women taking on decision-making roles within the management structures of POs.
Expand	Expansion refers to the uptake of the innovation by development actors that are either similar to, and/or in competition with, the development partner who piloted the innovation. This expansion may include imitation and replication of the original innovation, or adaptation and contextualisation. In the case of STARS, this includes the expansion of innovations to other, non-STARS MFIs or POs, or other non-targeted value chains.
Respond	Respond refers to the extent to which the innovation has incited market players in supporting systems to react to the new market reality, by re-organising, assuming new or improved roles, or moving to take advantage of new opportunities. The response enables the behaviour or practice changes to develop further, or evolve, and indicates a new capability within the system to support pro-poor solutions. For STARS this includes e.g. financial institutions changing their policies to support refinancing of agricultural loans across the sector.

The four components are structured into two phases: the piloting phase, and the crowding-in phase (see Figure1). The purpose of the **piloting phase** is to trial the innovation with the target stakeholders, and to assess the extent to which the innovative behaviour or practices are implemented, controlled and owned by these individuals or groups. During the piloting phase, the model encourages development actors to reflect upon building the level of ownership of the innovation (promoting Adoption) and maintaining awareness of how other stakeholders in the system are responding to the new behaviours and practices of these early adopters (Adaptation).

After the piloting phase, the newly catalysed transformations or innovations within the target market system may be strengthened and further embedded through either autonomous market responses, or through facilitated interventions. Within the AAER model, this is termed the **crowding-in phase**, and aims to encourage or promote a wider shift within the supporting economic, political, social and environmental conditions to embed the sustainability of the innovation and support it to gain momentum beyond the original actors, institutions and value chains.⁴

Pilot phase	Crowding-in phase
Adapt	Respond
Adopt	Expand
Actor-level change	Systems-level change

⁴ There have been subsequent revisions of the model, for example Gisin et al (2018) who added the axes of sustainability and scale; and Lomax & Shah (2020) who augmented it with the concept of 'changing resources'; a new element of the system introduced by the intervention which supports the behavioural change, and which explains why the change did not occur organically. Lomax (2020) further proposed to decouple the components of the system to establish the actor-level components within the systems-level analysis.

In this Working Paper, the AAER framework and underpinning theoretical model are used to structure the presentation and discussion of the selected STARS innovations, presented through case studies. These case studies present the challenge and selected innovation, and then describe the sustainability and ownership of the outcomes in relation to the four quadrants of the AAER framework model.

Pro-poor systemic change, signalled by innovations that result in outcomes which could be classified as Expand and Respond, is the goal of the MSD approach. However, such changes are generally incremental and longitudinal, occurring after the lifetime of the intervention and therefore not systematically captured by programme evaluations and assessments. Therefore, the success and sustainability of MSD innovations cannot be reliably measured through snapshot assessments conducted at the end of the project. After all, innovations that are Adopted and Adapted may trigger systemic change later, once (sustained) success in the piloting phase encourages buy-in through mechanisms of Expand and/or Respond.

5.2 MSD Doughnut

The MSD doughnut (see Figure 2) is the second framework used in this Working Paper to categorise and analyse the STARS innovations presented through the case studies. This model provides a systems-centric framework for understanding and mapping out market systems in terms of three elements; core transactions, formal and informal rules, and supporting functions influencing these (see Table 4). These functions are implemented by a range of actors and stakeholders, including the public and private sector as well as civil society.

This MSD Doughnut can be used as a descriptive instrument to arrive at a systematic inventory of functions and rules. It can also be used as an analytical tool to understand the environment, conditions and constraints that influence or inform the core transactions, and the interaction between these functions, rules, and the core transaction.

Table 4 » The components of the MSD doughnut	
Core transaction	The core mechanism of supply and demand at the heart of the market system. These include simple exchanges of goods and services by smallholder farmers as well as more complex chains of transactions involving diverse stakeholders across the supply chain.
Supporting functions	Supply chains can only develop and thrive in the presence of supporting functions including appropriate services, infrastructure and resources. This wider network of related services supports the core transaction and informs the benefits for smallholder farmers.
Rules	Value chains and their related supporting functions exist in economically, politically and socially specific contexts and environments; informed by the underpinning formal and informal rules, regulations, attitudes and values which shape the environment of the core transaction.

Central to the STARS approach has been identifying and understanding how the overarching market systems function to support or inhibit the success of smallholder farmers. By understanding and articulating underlying systemic constraints, appropriate innovations were developed in order to catalyse systemic and sustainable transformations in these underlying functions and/or rules. In this Working Paper, we use the core components and sub-categories of the doughnut model to structure and analyse the selected innovations presented through case studies, and to analyse how these innovations influence the core transaction of supply and demand.

6. CORE MARKET AND SUPPORTING FUNCTIONS

Smallholder agriculture remains a significant economic activity providing both food production and income generation for rural populations of STARS target countries: Burkina Faso, Ethiopia, Rwanda and Senegal. Smallholder farmers face challenges in maximising their production and productivity to ensure food security and facilitate income generation. For most crops and value chains, access to sufficient, high quality, affordable inputs remains a major impediment for farmers seeking to pursue farming as a business. A conventional approach to development dictates that development organizations provide these missing services (such as training or quality inputs) directly to farmers, facilitating improved production, income generation and food security.

The MSD approach, however, positions the core market dynamic of supply and demand at the heart of the market system, epitomised by the simple exchange of goods or services. In the case of STARS, the core market may include smallholder farmers selling their crops, or buying agri-inputs. Although such exchanges may appear simple, they are merely components of long, complex chains of transactions involving multiple stakeholders across many levels; including producers, processors, traders, shopkeepers, and so on. STARS, in line with good MSD practice, facilitated smooth functioning of the core market function by introducing innovations in the surrounding supporting functions and rules.

In order to function effectively, supply chains are dependent on a robust foundation of supporting functions: information, infrastructure, skills, technologies, and services. These include access to transport, irrigation services, agricultural inputs, and credit.

Recognising that access to relevant, affordable, high quality supporting functions can transform the core transaction of the market exchange for smallholder farmers, STARS implemented innovations aiming to catalyse sustainable shifts in the quality and availability of supporting functions for smallholder farmers.

6.1 Access to information

A key challenge facing weaker stakeholders within market systems is ‘information asymmetries’; rural smallholder farmers and POs lack information to make informed decisions, for example on pricing or demand. Approaches taken by development actors aim to improve access to information.

STARS aimed to support farmers and their organisations to overcome this challenge by providing sustainable access to business development services (BDS). The standard development model of BDS delivery is predicated on the assumption that services must be provided by NGOs and development actors free of charge, as farmers are unable or unwilling to invest in services with delayed or indirect financial return. Some actors even use added incentives to encourage and support attendance (e.g. per diems, transport allowance, etc.). This approach benefits producers and results in improved knowledge and skills and enhanced practices in agriculture; but ultimately the model is unsustainable as the BDS services are reliant on direct financial support from the project.

STARS sought to overcome this sustainability challenge and embed a self-sustaining model of BDS which could be adopted and fully owned by stakeholders at the grassroots level; supporting suppliers to provide tailored and appropriate BDS aligned with the needs and capacities of producers.

Case study: Establishing sustainable Business Development Services in Burkina Faso



Working closely with farmers and POs to select the most relevant services for farmers and agribusinesses, STARS supported PO leaders to define and validate **fee-based mechanisms** to provide skills trainings and technical advice in good agricultural practices (GAP), input selection and application, harvesting and post-harvest handling, marketing, transportation and access to finance.

Selected farmers pay fees for the services they receive, supporting the service providers and **embedding sustainability**. Women farmers are eligible for reduced costs, **ensuring inclusion**. Agricultural business development services are exempt from tax and VAT, **maximising accessibility**.

Five POs specialising in sesame production in Burkina Faso **ADOPTED** the model in 2018, and it was subsequently **ADOPTED** by five additional POs in 2019 when it proved successful. Later, the model **EXPANDED** to 17 POs. Participating POs have even validated and institutionalised the sustainable BDS mechanism in their general assemblies.

- **400 endogenous BDS providers** have been capacitated to provide services to farmers through a sustainable model.
- **17 POs** in both the sesame and shea value chains have **ADAPTED** the model to their needs, and established competitive and relevant services to support their members with skills development and income generation.
- In total, **80% of producers** report that they are able to pay for the BDS services they need.

As other market actors expressed interest in the new model, STARS **hosted two workshops** to share experience and best practice and **EXPAND** the model to other NGOs, government bodies and donors. The government project Cadre Intégré Renforcé (CIR) has now adopted this approach, enhancing their sustainability and enabling them to reach and support more farmers.

6.2 Infrastructure

Effective market systems benefit rural smallholders best in contexts where the available infrastructure supports all aspects of the value chain. In the case of farmers, this includes access to storage facilities which enable farmers to minimise wastage and efficiently store produce which can be sold during periods of market scarcity, when prices are high.

Case study: Establishing warrantage systems in Senegal

Despite the low market prices, many cowpea farmers in Senegal sell their produce immediately after harvest in order to repay debts and loans, overcome storage challenges, and provide for immediate household needs. In 2016, a warrantage system was introduced by STARS to enable farmers to obtain both skills and financial credit to improve their income generation through enhancing processing and storage of crops. Although such systems had been piloted in Senegal before, the STARS approach aligned several key supporting conditions to facilitate sustainable adoption of the innovation:

- Three MFIs (MFN, U-IMCEC, UFM) offered a **modified credit product with disbursements and repayments aligned with the agricultural cycle**.
- The warrantage product offered both **individual and group loans**. Group loans were an innovation developed with the MFIs, which **enabled more women to access credit**.
- Developing the **capacity and skills** of POs (FAPAL, COPAKEL, FADEC Nord) enabled them to manage their own storage facilities effectively and efficiently, improving quality, minimising wastage and maximising profits.
- Farmers were supported in **post-harvest handling** skills in order to:
 - Improve the quality and volume of produce.
 - Reduce perishability and wastage.
 - Delay marketing.
 - Increase market prices up to 100%⁵.
 - Aggregate individual harvests to facilitate bulk transactions.
 - Reduce transport and handling costs.

Initially, large facilities were leased from the Government in centralised locations. Farmers in remote rural locations found it difficult to access the warehouses, and so **ADAPTED** the model by renting smaller warehouses in closer proximity to the villages. Participating POs built-in improvements to the processing and storage methods and facilities, improving quality, reducing losses and increasing prices year on year

The broader market system has **RESPONDED** to the innovation as rumours of the increased and aggregated volumes of produce attracted bulk traders from urban markets. **Structural market changes** are likely to follow as improved supply **reduces gluts, shortages and price fluctuations**.

⁵ See for details: <https://www.icco-cooperation.org/en/blogs/warehouse-loan-a-promising-product-for-smallholder-farms-in-senegal/>

6.3. Skills

STARS identified key knowledge gaps which limit POs and smallholder farmers from maximising their yield and income in the target value chains. Analysis of these challenges identified a number of constraints facing target stakeholders; farmers struggle to afford the price of private-sector trainings, while past NGO interventions were offered to small samples of farmers for a limited duration, with limited follow-up and backstopping have been project-specific and ceased when the projects ended.

Many NGO and past projects have delivered services and skills trainings to producers; contracting external experts, often from urban centres, to deliver technical trainings for local farmers at the grassroots level. These interventions share similar aims to STARS, seeking to transfer and embed relevant technical skills and knowledge to smallholder farmers. However, the challenges of this approach are well documented, and were highlighted by smallholder farmers during the initial needs and capacities assessment phase. Cultural, educational, trust and language barriers impede agricultural knowledge transfer from external 'experts'. Farmers accustomed to regional dialects are unable to fully understand trainings delivered in the official language spoken in urban areas; and farmers struggle to relate to trainers from different cultural or ethnic backgrounds. In some cases education is a barrier, with poorly educated and often illiterate rural farmers struggling to understand the technical terminology of educated trainers, and failing to benefit from written materials. Dynamics of trust are also critical as change can be threatening, especially where livelihoods and food security are perceived to be at risk. In addition to these immediate challenges, the external 'expert' is often unavailable after the funding ends, and backstopping is therefore limited. Without robust, timely and accessible backstopping and follow-up, expectations around informal knowledge sharing and diffusion of benefits can be unrealistic. At worst, informal knowledge sharing can even result in shared misinformation and the wider implementation of poor practices.

To overcome these challenges, STARS selected, recruited and trained local facilitators through a Training of Trainers (ToT) programme to ensure that skills and knowledge would be embedded in local communities; providing bespoke ToT support to empower local expertise, enhance ownership, and overcome the sustainability challenges of traditional external support mechanisms.



Case study: Training Trainers to embed sustainable skills in Burkina Faso

Endogenous facilitators were supported to provide technical skills training services to local producers according to their needs. These services are provided on request, to ensure that they are timely and relevant for smallholder farmers. Ensuring sustainability, producers provide payment for these trainings in goods, services or cash. This paid service-delivery model supports the local facilitators and ensures that they are fairly compensated for their time and effort.

The model has been **ADOPTED** by **90 local facilitators** in **3 POs** (ADEP, TINBA and GIE YERETA) who now offer **5 types of training**:

- Good Agricultural Practices (GAP).
- Post-harvesting good practices.
- Best use of fertilizers and chemical pesticides.
- Farming as a business.
- Financial education.

So far, **73,180 smallholder farmers** have benefitted from this training, provided by more than **400 endogenous facilitators**.

Participating POs have reported **significant increases in productivity** as a result of training, with an average increase of **73%**. One participating PO more than **doubled their production**, from 263 kg/ha to 555 kg/ha, an increase of **111%**.

As a result of these successes, the model has **EXPANDED** and **six local government technical agencies** have also begun using trained endogenous facilitators to support the delivery of skills training to local producers, and to monitor the effectiveness and impacts of their work. Other POs within the community have also expressed interest in implementing the model, and further organic expansion may follow.

6.4. Technology

Modern technologies can reduce the labour demands and increase the productivity of agricultural activities for rural farmers. However, for resource-poor smallholder farmers across Africa, many of these technologies remain inaccessible due to their high start-up costs. Solar technologies in particular provide a sustainable and cost-effective technology for agriculture, and also reduce reliance on fossil fuels and the associated fluctuating and unsustainable costs which erode profits and maintain dependencies.

Case study: Financing solar innovation in Senegal



Smallholder farmers in Senegal face challenges in accessing sustainable technologies to support their production, and struggle to meet the costs of fuel for irrigation. It was also challenging for farmers to meet the high start-up costs associated with solar technologies, and so were trapped in a vicious cycle of high fuel costs and reduced profits.

To address this challenge, in 2019 STARS negotiated with, and networked, MFIs and solar equipment suppliers to develop and **ADOPT** a tailored loan and equipment package to provide the appropriate solar equipment for irrigating onion crops. The loan and equipment packages were closely designed for the needs and capacities of local smallholder farmers; to enable them both to access and to afford solar technology, and to make repayments tailored to the agricultural cycle of their crops.

- **2,374 smallholder farmers** accessed solar loans through this intervention.
- **150 farmers benefited from individual loans** and **2,224 farmers accessed group loans**.
- On average, participating farmers have **reduced production costs by 23%** through adopting solar irrigation technology.
- Four participating MFIs (UFM, MEC FADEC NJAMBUR, CAURIE Microfinance and UIMCEC) secured **minimum profits of 6%**⁶.
- Solar equipment suppliers reported **profits of 15% - 20%**.
- Participating farmers report **86% - 100% satisfaction** with their solar loans.
- **78% of participating farmers** would recommend the solar loan product to others.

Following their successful launch, the solar loan credit packages have been rapidly integrated into participating MFI portfolios. Furthermore, the success of these loans has encouraged MFIs to **ADAPT** their business model and credit packages, increasingly regarding smallholder farmers as a viable and profitable client group. As a result, further innovations and tailored credit packages have been developed for smallholders. Solar equipment suppliers have benefited from strong and sustainable markets for solar equipment and parts, and increased linkages with financial institutions.

⁶ For an average portfolio of 60 million FCFA (USD 120 000).

The solar loan credit product was rapidly **EXPANDED**, with high demand from farmers and high levels of uptake from MFIs. MFIs have included additional equipment suppliers in private sector partnerships, and solar loans are now an established credit package, also in locations that were not targeted by STARS.

This innovation has been effectively and systemically institutionalised by MFIs, contributing to a broader market **RESPONSE** and shifts in mind-set recognising that smallholder farmers represent a profitable and reliable client group, embedding sustainability. For smallholders, the benefits are rapid and tangible, and are likely to contribute to broader outcomes for wellbeing and livelihoods.

6.5. Related services

In addition to access to infrastructure, skills, technology and information, the success of actors in the agriculture sector is informed by a wide range of related services and service providers. At the outset, STARS prioritised improving market access for producers by enhancing their access to skills, information and networks with potential buyers and processors. However, the STARS Programme-Embedded Reflection and Learning (PERL) MEL systems illuminated broader constraints, such as poor access to agri-inputs and related services, affecting smallholder farmer production and productivity. Thus, thus the programme developed innovations targeting these aspects

In Ethiopia for example, an identified challenge concerned access to improved potato seed; with STARS producers reporting access to 7-8 year old seed with very low yield. Public research institutions release new seed varieties infrequently, while private sector engagement is reported to be limited due to the high investment of time and resources needed to produce new seed varieties.

Case study: Boosting inputs for the potato value chain in Ethiopia



Potato is an important crop for food security and commercial production in Ethiopia, characterised by a short harvest cycle and relatively high yield per hectare. Recognising the need to improve access to high yield potato seed for smallholder farmers, in 2019 a regional workshop was organised for key stakeholders in the potato seed supply system. After securing their buy-in to develop access to improved seed, STARS conducted a participatory mapping and needs assessment exercise. To avoid replication of efforts or unintended consequences for existing research enterprises, ongoing initiatives at laboratory and field levels were identified and mapped for collaboration and support. Following a thorough assessment to identify challenges facing the seed producers, STARS initiated collaboration between Waginos Biotech⁷ and ARARI⁸; and between Waginos and seed multipliers (Solagrow⁹ and a private seed farm owner) and provided capacity development support to Waginos to furnish its laboratory. Waginos has **ADOPTED** and institutionalised these changes, continuing to produce plantlets and actively searching for new markets. In 2020 a national workshop was organized by STARS to present the 2019 pilot's achievements and challenges. Participation of the Ethiopian Institute of Agricultural Research (EIAR) and the Ministry of Agriculture in the workshop showcase interest at the federal level, **EXPANDING** the innovation beyond the regional level.

- **40,000 high-yield potato plantlets** have been produced by Waginos in different cycles.
- **10,000 high-yield plantlets** have been distributed to private seed farm owners for multiplication.
- The high profile actions and national events organised by STARS brought the problem of potato seed to the attention of policy influencers.

Market actor ARARI has **RESPONDED** and innovated further, introducing a new form of multiplying plantlets (apical cutting) which is easily manageable and more productive than the previous process. Seed multipliers have expressed interest to receive plantlets and multiply into seed, further **EXPANDING** the benefits of this innovation.

⁷ A private company from Addis Ababa that specializes in plant micropropagation, such as potato tissue multiplication.

⁸ Amhara Agricultural Research Institute, a government institute based in Bahir Dar that aims to generate, improve, adapt and popularize agricultural technologies and multiplies and disseminates starter technologies.

⁹ Solagrow focuses on the supply of biological inputs and cropping technology to support the Ethiopian farmers to produce more and better food and thus to contribute to a better well-being of the Ethiopian people. Improved varieties of potato, vegetables and oil seed crops are introduced, registered and made available for those farmers on a commercial basis.

Case study: Improving cowpea seed multiplication in Senegal



Cowpea was selected as a key value chain by the STARS team as an opportunity to support gender inclusive processes as the crop is mostly grown and processed by women. Climate change impact mitigation effects and enhanced food security were also expected, as the crop is drought tolerant and is replacing groundnuts in the area. In 2017, an agreement was reached between STARS, RESOPP (a network of producer organisations), individual POs (COOPAKEL, FAPAL and FADEC NORD) and the government on seed production. Cowpea seed multiplication, previously in the hands of government agricultural stations, was **ADOPTED** by the selected POs, and new varieties were introduced.

- **Increased volumes of cowpeas** were produced and supplied to the market.
- Seed multiplication is now **regular and lucrative** in participating POs, and a core element of their agricultural improvement strategy.
- The intervention contributes to **enhanced climate change mitigation** and **food security** outcomes.
- **Positive outcomes for women producers.**

POs who participated in the developing cowpea seed multiplication industry are now **EXPANDING** into the production of improved seeds for the onion VC. This is unique, as the major suppliers of onion seeds are mostly abroad; in the Netherlands and elsewhere. The cowpea seed market is rapidly **ADAPTING** and **RESPONDING** to the change in supply, with regard to quality and variety of seeds from POs. Other crops are being taken on in the same manner. Again, this is a case where technical (seed multiplication), financial (tailored loans and group loans), social (group loans), and organisational (linkages between new partners in the markets) innovations have coalesced into a rapidly changing value chain. Various levels in those value chains were affected simultaneously (seed multipliers and suppliers, seed producing and purchasing farmers, POs, MFIs, bakers and government).

- **10,000 high-yield plantlets** have been distributed to private seed farm owners for multiplication.
- The high profile actions and national events organised by STARS brought the problem of potato seed to the attention of policy influencers.

Market actor ARARI has **RESPONDED** and innovated further, introducing a new form of multiplying plantlets (apical cutting) which is easily manageable and more productive than the previous process. Seed multipliers have expressed interest to receive plantlets and multiply into seed, further **EXPANDING** the benefits of this innovation.

Case study: Facilitating collaboration for improved malt barley production in Ethiopia



Malt barley production is input intensive: optimum quality, timely supply and reliable input sources significantly enhances smallholder productivity and ensures sustainable growth. Improved access to high quality inputs at key points in the agricultural cycle can improve yields by 50%. Poor access to quality inputs is therefore a significant constraint for malt barley producers in Ethiopia.

The production, import, pricing, and distribution of inputs is dominated by government organizations and agencies, while MFIs have no mandate to provide inputs themselves and the private sector has not yet risen to the challenge effectively. The challenge of access to inputs contributes to the perception of agricultural finance as high risk, and accordingly this client base is underserved by financial institutions in Ethiopia.

In partnership with key stakeholders including Wasassa MFI and three Farm Service Centers (FSCs), STARS developed and supported innovative collaborations between MFIs, FSCs and MFI clients. These collaborations were designed to address the problem of access to inputs for smallholder farmers engaged in malt barley production by combining tailored loans with embedded extension services, and have now been **ADOPTED** by all participating stakeholders.

Overall, the collaboration improves the efficiency and effectiveness of the input supply system; creates mutual interdependencies among the different actors; ensures accountability as each actor plays its accorded role (mandate); and increases farmers' yield, income and food security.

- Three branches of Wasassa MFI now collaborate with three FSCs (Huruta, Etaya and Sagure) to combine credit packages with quality inputs.
- **400 malt barley producers** (30% female) benefited from access to improved seed, agrochemicals, training and advisory services.
- Producers report a **9% average increase in production and productivity**.
- MFIs continue to provide **tailored agricultural loan packages**.
- Farmers benefit from **free, embedded advisory and extension services** through the FSCs.
- MFIs **expand their client base** and report **reduced rates of defaulting, reduced transaction costs and increased profits**.

-
- FSCs promote their services and penetrate the market, while simultaneously serving farmers with their professional skills.
 - Financial costs for FSCs are reduced, as they no longer need to budget to secure input stock.

The innovation has excellent potential for broader implementation and **EXPANSION**. The government of Ethiopia is increasingly opening up spaces for the private sector to play a role in the provision of agricultural services. Malt barley production is also expanding rapidly in many parts of the country, with huge potential for production and a vast, largely untapped target market for MFIs. Six additional MFIs and seven FSCs have expressed interest in adopting the model.

6.6. Underpinning rules

Value chains with their associated supporting functions are enmeshed and embedded in institutional and legal contexts and conditions, and the core exchange is therefore informed by standards, regulations, laws, informal rules and norms. These influence the opportunities and power of buyers and sellers throughout the value chain, informing the distribution of economic benefits in particular contexts.

For women in particular, structural exclusion from decision-making bodies, such as PO management committees, undermines their access to the fruits of their labour. Women farmers are often the most active community members in agricultural activities like planting, weeding and harvesting; but are systematically excluded from post-harvest value addition and marketing. Women often lack market negotiation skills, and household obligations restrict their mobility and opportunities to search for market information. Management committees of POs are male-dominated, and are often unaware of gender-related challenges of their members.

The STARS programme aimed to catalyse sustainable shifts by embedding innovations within these rules and institutional structures of participating value chain actors, for example by enhancing women's representation in decision-making bodies, as well as building their confidence and communication skills.

Case study: Enhancing women's representation in PO management structures in Rwanda



STARS strategically encouraged 15 partner POs (specialising in maize and rice) to **ADOPT** gender committees, in order to identify and address challenges faced by women. These committees were trained on the rules, regulations and management of the cooperative, as well as gender equity, equality and gender conflict management. Consequently, these gender committees became active advocates for their female members to participate in PO management, sensitizing members on the importance of having women in their leadership structures. These POs have **ADOPTED** the gender committees and integrated them into internal rules and leadership structures, endorsed in their general assemblies.

- 15 partner POs **doubled the representation of women** in PO management structures.
- **21,364 PO members** benefit from improved women's representation in their POs.
- Through lobbying POs, gender committees ensured that women farmers received fair payment for the sales of their produce, rather than channeling payments through their husbands or male relatives.
- Changes in PO rules now prevent husbands from securing loans or advance payments in their wives' name without consent.

The gender committees have already been **EXPANDED** to 10 non-STARS POs; six in rice value chains and four in maize value chains. Most of these POs are neighbouring the STARS-supported POs in Nyagatare, Bugesera, Kihere, Gisagara and Kamonyi districts. STARS-trained local gender consultants are now in demand from other clients, and employ this gender-sensitive approach in supporting other interventions.

These processes are supported by, and **RESPOND** to, wider shifts instigated by the government of Rwanda, who have developed a [national gender policy](#) and established various institutions and strategies for gender promotion and women's inclusion and awareness.

Case study: Transforming cowpea to flour in Senegal



In Senegal, cowpea producers faced challenges accessing reliable markets and securing lucrative contracts with regular buyers of the crop. Bakers also faced challenges accessing ingredients, and the price of wheat flour is prohibitively high due to limited local availability and high import costs. This led to substitutions and the production and sale of poor quality bread for consumers.

Together with producers, processors and MFIs, a business opportunity was identified for the increased inclusion of cowpea flour in the bread and pastry industry. STARS facilitated commercial linkages between two POs specialising in cowpea production (COOPAKEL and FAPAL) and the National Federation of Bakers (FNBS) through Business to Business (B2B) events, and supported capacity building of PO members to improve quality cowpea production, harvesting and postharvest handling.

FNBS provided training of its members and promoted the knowledge and technology to facilitate the inclusion of cowpea flour (up to 10%) in the bread making process. FNBS has successfully **ADOPTED** this innovation and technology, and cowpea bread and pastry can now be found in many bakeries in Dakar, Thies and Saint Louis.

- Participating POs benefit **from reliable access to sustainable markets**, with two contracts signed between COOPAKEL/ FAPAL and FNBS.
- Participating POs report **increased income** as a result.
- **One hundred baker members** of FNBS in Dakar, Thies, Louga and Saint Louis Region benefited from practical training sessions in the use of MockMill machines for processing and baking with cowpea flour.
- 100 trained bakers report **10% increase in revenue**, on average.
- For consumers, cowpea flour increases the nutritional value of traditional wheat bread by **adding 8% more protein**.
- The increased use of locally produced cowpea inputs **reduces reliance on imported wheat flour** for bread production.

The partnership with the nationwide FNBS has embedded the sustainability of this innovation. Given the successful outcomes reported so far, **EXPANSION** is likely. Other development organisations have also contacted FNBS directly to learn more about this technology, including USAID, which is a positive development.

Case study: Enhancing strategic and operational risk management in Rwanda



STARS used a two-pronged strategy to support MFIs with the development and institutionalisation of skills and tailored tools to build risk management capacities. Strategically, MFIs have been supported to **ADOPT** risk management committees to monitor financial, liquidity, fraudulence, operational and strategic risks. This approach has contributed to the systematic integration of a strong knowledge base and good practices around risk in the structure of MFIs, supported by selected champions and structured guidance and reference materials. MFIs have also been supported to **ADOPT** and institutionalise tailored tools and mechanisms, including the A-CAT tool (both in manual and digital formats), the loan portfolio monitoring tool, and liquidity management through Asset/Liability management.

- **Seven MFIs** (Goshen, Umutanguha, Ejoheza, Amasezerano, Duterimbere, RIM and Inkunga) have been supported to develop and institutionalize risk management capacities.
- Improvements are embedded through **collaboration with the Network of Microfinance Institutions (AMIR)**.
- **118 loan officers** have been trained in the use of A-CAT, and use it to support decision-making at the branch level; decentralising risk management.
- Participating MFIs have developed **appropriate credit packages and communication materials for agricultural clients**.
- MFI consultancies (e.g. AMIR Consult) have enhanced capacities to understand and implement risk management plans and strategies.
- Defaulting has reduced and more farmers are able to meet the repayments on their loans, as loans are tailored more closely to their needs and capacities.

Originally, STARS supported 2 MFIs to **ADOPT** risk management strategies. The model has now **EXPANDED** as two further MFIs have begun using the A-CAT tool and developing risk management manuals, using the guide provided by STARS. Participating MFIs are also **ADAPTING** the tool for use with other crops, reflecting its success.

At the national level, the AMIR has supported the **EXPANSION** of the risk management trajectory, promoting the A-CAT innovation to their 390 members. The National Bank of Rwanda has expressed interest in the risk management strategies and tools, and other MFIs and SACCOs have approached AMIR to request support and capacity building with their risk management.

7. CONCLUSIONS

This Working Paper has described and analysed the STARS approach to innovation in market systems, through presenting a range of case studies from Burkina Faso, Ethiopia, Rwanda and Senegal selected by the STAR team members. These case studies are analysed through the lens of the AAER framework, exploring the extent to which local actors have institutionalised and embedded the innovations, and reflecting on their sustainability across these diverse contexts. The working paper concludes by presenting four lessons from STARS which may be valuable for practitioners and academics who seek to conceptualise and implement effective and sustainable MSD innovations:

7.1. Value the existing knowledge base: Continue building on experience

Value chains with their associated supporting functions are enmeshed and embedded in institutional and legal contexts and conditions, and the core exchange is therefore informed by standards, regulations, laws, informal rules and norms. These influence the opportunities and power of buyers and sellers throughout the value chain, informing the distribution of economic benefits in particular contexts.

As the case studies demonstrate, the most successful innovations were developed through participatory methods, building on a robust foundation of previous experience and learning. This enabled the programme to acknowledge, value and build on the past experiences and insights of actors in the market system, while addressing gaps and identified vulnerabilities through innovative, creative and relevant solutions. These strong foundations and existing relationships facilitated the rapid and sustainable adoption, adaptation and expansion of the innovations, ensuring that ownership remained high among key market actors.

For example, while STARS' **sustainable BDS trainings** were a new innovation in Burkina Faso, farmers were familiar with the FFS model and accustomed to receiving technical support and skills training from NGOs and government bodies. This past experience gave farmers the confidence to recognise that enhanced skills could result in improvements in the quality and quantity of their yield, and ultimately enhance their lives and livelihoods. Past experience had already built local appetites for technical trainings, and familiarised farmers with the format of these trainings. Thus, the shift to embedding the training mechanisms into the local community level structures, and ensuring sustainability through fee-based approaches, was well received. Smallholder farmers regarded these trainings an acceptable investment, and were willing to take a small financial risk with the anticipation of significant future gains.

Meanwhile, responsive monitoring of ongoing interventions (through PERL) informed appropriate and timely adaptations in STARS' approach and focus, embedding adaptive management practices in a robust knowledge-base to support evidence-informed decision-making. As a result, each individual innovation was carefully monitored to identify opportunities and challenges, where possible in real time. On a continuous basis, interventions were adapted to better reflect the needs of all relevant stakeholders. Thus, some innovations described in this paper were introduced barely two years ago, and have undergone extensive and evidence-informed adaptations throughout their implementation period. For these innovations to now demonstrate Expand and Respond components, signalling systemic shifts, is a testament to the success of STARS' commitment to continuous reflection, learning and improving upon past experiences. Nonetheless, because these innovations are rooted in the robust foundations of previous interventions, and reflect evidence-informed adaptations of these previous iterations, their impact and sustainability is enhanced, and the likelihood of catalysing systemic change increases.

7.2. Embrace a hybrid approach: Catalyse systemic shifts

STARS achieved significant and sustainable positive outcomes in the target communities and value chains through adopting a hybrid approach; linking and layering innovations to embed dynamic and mutually supportive relationships between the functions and underpinning rules of the target markets. In this way, the innovations catalysed behavioural change among smallholder farmers and other actors, POs, and MFIs. Simultaneously, this approach embedded systemic transformations within the participating organisations such as POs and MFIs, to provide enduring and sustainable foundations for the innovations to become institutionalised and support broader normative shifts.

For example, innovations introduced to POs (e.g. **sustainable BDS and women's representation** in PO management) were institutionalised within their committee and governance structures to ensure that underpinning rules and regulations supported these innovations, and reinforce the expected behavioural changes with institutional support mechanisms. The **warrantage** innovation, combines improved post-harvest handling and processing with improved storage facilities, in concert with professionalising the governance and accountability mechanisms of POs, enabled them to build strong relationships of trust with financial institutions and bulk buyers to strengthen their position in the market and support smallholder farmer members.

This institutionalisation of innovations also underpinned STARS' partnerships with MFIs, ensuring that new practices ideas (**from tailored agricultural credit packages and risk assessment tools**, to recognising smallholder farmers as a viable and profitable client group) were institutionalised and embedded in their operational and strategic planning and procedures, and in management and governance structures. Capacity building for both MFIs and POs included organisational management and accountability as well as policy-making and strategic planning, ensuring a horizon-scanning and adaptive mind-set was thoroughly embedded within these organisations. Capacity development also contributed to a wide range of unexpected positive spill-over effects. For example, **enhanced risk management** in MFIs resulted in improved services for clients. Simultaneously, this enabled participating MFIs to attract increased resources as banks and foundations recognised and responded to their improved financial management practices and structures.

7.3. Participatory partnerships: Value chain actors at centre stage

STARS adopted a participatory approach, working in partnership with smallholder farmers, POs, MFIs and the private sector to enhance ownership and ensure that innovations were rooted in a robust understanding of existing needs, capacities and willingness to adopt the innovations. Investing resources in a thorough and participatory planning and design phase paid dividends in ownership and adaptation of the innovations introduced.

For example, MFIs were supported to use the **A-CAT** tool which was closely aligned with their expressed needs and existing capacity gaps, enabling them to **provide tailored credit packages** for agricultural clients and reduce risks. Furthermore, high levels of ownership resulted in MFI stakeholders adapting and improving the tool to more closely align with their needs, embedding sustainability and shifting from an external innovation to an internal mechanism.

The collaboration between Wasasa MFI and FSCs to improve smallholder **malt barley** production is another example of how a thorough understanding of the needs of different market actors facilitates innovative yet sustainable business innovations. The same can be said for the collaboration addressing the availability of improved potato seeds, eventually securing buy-in from laboratories and plantlet producers and achieving scale by including government actors such as the Ethiopian Ministry of Agriculture and national research institutes.

7.4. Building networks across the value chains

A key underpinning of the MSD approach is the importance of strong networks across the value chain, and the STARS programme aimed to build and strengthen these networks within and beyond the eight target value chains. Starting at the core transaction of supply and demand, STARS strengthened relationships between agricultural producers and purchasers, but also aimed to enhance relationships with financial service providers, processors, private sector and government services, for example through B2B events. Building these linkages with wider market actors leaves a legacy of intersecting professional networks which these actors can continue to build and develop over time, embedding the outcomes of the programme into existing systems and structures for sustainable and locally-led change.

For example, facilitating commercial linkages in the **cowpea value chain**, between two POs specialising in cowpea production and the National Federation of Bakers in Senegal, has created and expanded new market opportunities. These have wider implications for enhanced income generation across the sector, support investment in the cowpea value chain, as well as increasing profits for bakers and enhancing nutrition and food security for consumers.

By aligning and embedding innovations within and between value chains and actors, the STARS programme aimed to catalyse mutually supportive, internally coherent and structurally embedded innovations which can be sustained, adapted, expanded

and replicated beyond the original intervention design, contributing to the development of the agricultural sector and improved lives and livelihoods for smallholder farmers and actors across the value chain.

The strategic layering and systematic reinforcement of innovations within and between levels in the value chains, and the growing mutual influence, interdependency and synergy they generated, caused a qualitative and progressively self-sustaining shift in the target market systems and beyond. This diverse legacy is embedded in value chains across Burkina Faso, Ethiopia, Rwanda and Senegal, reflected in shifts in behaviours and practices, increasingly adaptive and professional mind-sets, and robust underpinning management and governance structures.

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CONTACT

Postal address
PO Box 16640
2500 BK The Hague
The Netherlands

Address
Grote Marktstraat 45
2511 BH The Hague

+31(0)70-31 36 300
info@cordaid.org
www.cordaid.org

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