



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## CASE STUDIES ON FACILITATING SYSTEMIC CHANGE

A SYNTHESIS OF CASES FROM GHANA, SENEGAL, ZAMBIA, AND RWANDA

LEO REPORT NO. 49

OCTOBER 2016



**USAID**  
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Leveraging Economic  
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# CASE STUDIES ON FACILITATING SYSTEMIC CHANGE

A SYNTHESIS OF CASES FROM GHANA, SENEGAL,  
ZAMBIA, AND RWANDA

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LEO REPORT NO. 49

OCTOBER 2016

## **DISCLAIMER**

This publication was produced for review by the United States Agency for International Development. It was prepared by Olaf Kula of ACDI/VOCA (synthesis), Charles Addo, independent consultant (Ghana case), MarketShare Associates (Senegal and Rwanda cases), and Dan White of ACDI/VOCA (Zambia case) with funding from USAID's Leveraging Economic Opportunities (LEO) project.

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# ACRONYMS & ABBREVIATIONS

ABS	Agro Business Services (See under “Ghana”)
ABS	African Breeders Services (See under “Rwanda”)
ADVANCE	Agricultural Development and Value Chain Enhancement project
AGDP	Agricultural Gross Domestic Product
ANCAR	National Agency for Rural and Agricultural Advisory Services (Agence Nationale Conseil Agricole et Rural)
BRB	Bonzali Rural Bank
CAD	Community agrodealers
CIRIZ	Interprofessional Rice Committee in Senegal (Comité Interprofessionnel du Riz au Sénégal)
CNAAS	National Agricultural Insurance Company for Senegal (Compagnie nationale d'assurance agricole du Sénégal)
CNCAS	National Fund for Agricultural Development of Senegal (Caisse Nationale de Crédit Agricole du Sénégal)
COMESA	Common Market for Eastern and Southern Africa
DCA	Development Credit Authority
DFID	United Kingdom Department for International Development
DRDR	Regional Directorate of Agriculture (Direction Régionales de Développement Rural)
ECOWAS/CEDAO	Economic Community of West African States/ Communauté économique des États de l'Afrique de l'Ouest
EDPRS	Economic Development and Poverty Reduction Strategy
FI	Financial institutions
FPA	Fédération des Perimetres Autogeres
GAP	Good Agricultural Practices
GGC	Ghana Grains Council
GHC	Ghanaian Cedi
GNI	Gross National Income
GoR	Government of Rwanda
GoS	Government of Senegal
Ha	Hectare
HACCP	Hazard Analysis Critical Control Point
ISRA	National Institute for Agricultural Research of Senegal (Institut Sénégalais de Recherches Agricoles)
JTI	Japanese Tobacco International
Kcal	Kilo calories
LOL	Land O'Lakes
MDG	Millennium Development Goal
MSA	MarketShare Associates
MT	Metric tons
NGO	Non-governmental organization
OB	Outgrower business
OG	Outgrower
PC	Producer company
PCE	Economic Growth Project (Projet Croissance Economique)
PFL	Premium Foods Ltd.
PPP	Public-Private Partnerships

PRACAS	Accelerated Program for Agriculture in Senegal (Programme de relance et d'accélération de la cadence de l'agriculture au Sénégal)
PROFIT+	Production, Finance, and Improved Technology Plus
RALIS	Rwanda Agriculture and Livestock Inspection Services
RDCP	Rwanda Dairy Competitiveness Program
RND	Rwanda National Dairy
SAED	National Society of Land Management of the Senegal Delta and River Valley (Société nationale d'Aménagement des Terres du Delta et de la Vallée du Fleuve Sénégal)
SAT	Sinapi Aba Trust
SH	Smallholder farmers
SWT	Strength of weak ties
USAID	United States Agency for International Development

# ACKNOWLEDGEMENTS

The authors wish to thank the LEO COR at USAID, Kristin O’Planick, for her support of, and patience for, this study. Key feedback was also received from a variety of USAID staff in the Bureau for Food Security, with the valuable assistance of Susan Pologruto and championing of Meredith Soule. This study is part of a series of studies on systemic change, a topic which provides a significant leap forward in our understanding of how market systems anticipate, respond, and adapt to change. We further thank Anna Garloch, the Program Manager of the LEO project for her support and multiple edits.

We acknowledge with gratitude the cooperation of the staff and management of the four projects included in these case studies. Despite multiple iterations of questions and clarifications, all four Feed the Future implementation teams remained patient and helpful. Even greater appreciation goes to the multiple value chain actors and service providers, for their cooperation was entirely voluntary and they are not compensated for the many hours they spend speaking to consultants. Through multiple clarifications, there is always a possibility of errors. These are entirely the responsibility of the author.

Finally, we wish to acknowledge the contributions of Sally Oh, and William Vu, of the LEO project. They ensured that the researchers got where they needed to go when they needed to be there and made a rather rough document appear as clean as the one we hope you will enjoy reading.

# EXECUTIVE SUMMARY

Feed the Future (FTF) is facilitating changes in core agricultural systems that contributes to more sustainable and scalable development objectives. This report summarizes the findings from research into four FtF projects, selected as illustrations of observable systemic change. The four projects are:

- **FTF Senegal Naatal Mbay**, which has introduced various alterations to the prevailing model for contract farming of paddy rice, including a price discovery process that reduced uncertainty that in turn unleashed widespread investment by financial institutions and processors into the more beneficial contract farming system, as well as an increase and improvement in the services to value chain actors, particularly agricultural machinery leasing.
- **FTF Zambia Production, Finance, and Improved Technology (PROFIT) Plus**, which is in the early stages of introducing changes in the structure of the rural input supply system through new aggregation models and agents, improving smallholder access to input and extension services. Interestingly, this has taken place in the context of two years of heavy drought, shifting behaviors from those that are revenue maximizing to those that are risk mitigating and resilience maximizing.
- **FTF Rwanda Dairy Competitiveness Program (RDCP) II**, which has introduced quality grades and standards into the dairy industry both through support for more formal policy-level changes as well as through firm-led behaviors and models that incentivize and reward for quality. Like Zambia, these changes are early in the systemic change process, but there are strong indications of imitation by other lead processors, independent replication, and that these behaviors and practices are beginning to become institutionalized and a ‘new normal’.
- **FTF Ghana Agricultural Development and Value Chain Enhancement (ADVANCE) II**, which has supported the emergence of a relatively new actor in commodity value chains, the outgrower business; this is changing the network structure of input and output systems in the target areas, increasing smallholder access to quality inputs, financing, and output markets.

The cases describe projects in four unique enabling business environments, with each systemic change in various stages of maturity. These cases also span a number of value chains: Zambia Profit + and Ghana ADVANCE II focus on maize; Senegal Naatal Mbay focuses on paddy rice, and Rwanda RDCP II focuses on dairy, with a particular focus on the urban market.

## What is Systemic Change?

Conceptualizing and defining systemic change is an evolving, fertile space in development. As discussed in Section I.B, there is no agreement within the market systems development field about how to neatly define systemic change. There is, however, a common emphasis on changes in the underlying structural elements of a system. These may include institutions, policies, behavioral norms, networks, and perceptions. In commissioning these case studies, USAID targeted projects they believed had facilitated changes at the structural level, and the researchers then utilized qualitative methods (e.g. focus groups, key informant interviews, document review) to assess those changes - supplemented with available project monitoring data when possible - organized around two categories of indicators: buy-in and imitation. These categories, presented below, draw from the 2014 literature review on *Evaluating Systems and Systemic Change for Inclusive Market Development*, produced by LEO:

1. **Buy-in<sup>1</sup> indicators**, which measure the degree to which market actors have taken ownership over the new business models, technologies, practices and behavior changes that were introduced and/or supported by the intervention. Some examples of buy-in indicators include the following:
  - Adaptation or innovation to the original, program-sponsored model(s)
  - Continued, independent investment after program sponsorship ends

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<sup>1</sup> “Buy-in” refers to much more than a mental assent or philosophical agreement with project-promoted models, technologies or behaviors. It signifies evidence of ownership through significant investment of financial capital, other resources, time, and reputation.

- Repeat behavior
  - Satisfaction with program-facilitated changes
2. **Imitation indicators**, which measure the scale or breadth of program-supported behavior change within a system. There are two prominent examples of imitation indicators:
- Crowding-in by other businesses that imitate program-sponsored business models originally adopted and demonstrated by businesses that collaborate with the implementer
  - Copying, mentioned less often than crowding-in, refers to imitation at the target beneficiary level by market actors (firms, farms, households or individuals) that imitate the new practices originally adopted and demonstrated by the target beneficiaries of the intervention.

Each case study explores the identified systemic change through these two lenses – buy-in and imitation. These two key domains of indicators have recently been expanded upon as LEO and others have further articulated elements of systemic change. This includes a greater focus on network and institutional structure, emergent patterns, and sensing changes at both the individual agent (e.g. single farmer, single firm, etc) and collective levels. Importantly, no project operated entirely outside the realm of subsidies – with some relying more or less on them, to support different elements, and at different stages of the process. This is area that deserves more attention in future studies, and as noted elsewhere in the report, supports ex-post assessments to better validate the sustainability of changes after projects end.

### Why Focus on Systemic Change?

The concept of systemic change is gaining increasing attention in donor-funded market development projects - and understandably so. Market development projects often involve investments of scarce donor resources in actors who are not part of the intended beneficiary group in order to make systems in which large numbers of the poor participate work better, and work better in ways which allow the poor to benefit. It is a legitimate and compelling question to ask: how can we be sure that investing in getting actors within a system to do things, or organize themselves differently than they have until now, in order to achieve inclusive growth actually achieves these expectations? How can we be sure that inclusive growth will continue after the program is over? Simply put, donors are interested in systemic change because of their interest in enhancing the scalability and sustainability of development outcomes. In recent years, across USAID, systemic change has gained increasing attention: in 2014 the Agency released *Local Systems: A Framework for Supporting Sustained Development*, which explored the logic behind linking systemic change to enhanced development outcomes and outlined ten principles for engaging in local systems<sup>2</sup>.

The urgency of the scalability and sustainability goals in some ways has put the determination of whether systemic change has occurred, ahead of the question, what is systemic change and how does one make sure that it happens. This report is an initial effort to respond to both questions by looking forward at four cases and backwards at a body of literature to support a theory of change.

In the growing literature on innovation and systemic change there are two distinct paths. The first begins with the introduction of a new way of doing or organizing things - an innovation - and asks how and with whom should this innovation be introduced and how and when can we determine that the introduced innovation becomes systemic, i.e. when forces adopting change outweigh forces opposing it. All the case studies fall into this category.

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<sup>2</sup> Access the framework at: <https://www.usaid.gov/policy/local-systems-framework>. For more on the relationship between local systems and market systems, see ACIDI/VOCA, 2016. *Local Systems and Market Systems*.: [www.microlinks.org/library/local-systems-and-market-systems](http://www.microlinks.org/library/local-systems-and-market-systems).



The second, called systems thinking, looks at how the *process* of change becomes systemic, i.e. how are new ideas, norms, and processes, drawn in by members of a network to disrupt a status quo in order to achieve greater growth and more inclusive growth. In systemic thought, issues including feedback loops, customer and SME churn (i.e. attrition) rates, flow rates (information and finance), alignment of these factors across levels (micro, meso, macro), etc. all come in<sup>3</sup>.

Systems thinking, however important is not a focus of this report. This report focuses on the first set of questions - how an innovation in rules, norms, and or processes is introduced, what factors affect the rate of adoption of the innovation, and how can one determine when the innovation has acquired its own momentum or the point where forces within a system in favor of an innovation have become stronger than the forces supporting the status quo.

Each project<sup>4</sup> case study (see Sections III A-D) focuses on a particular intervention that project management and the respective USAID mission believed represented the best illustration of systemic change among multiple interventions and multiple projects. Together they illustrate elements of the theory of change elaborated later in this report.

Each project introduced an innovation that disrupted a status quo in a set of processes, norms and or relationships – such as in Senegal, where the innovation involved revamping the prevailing model of contract farming in paddy rice. Each worked through actors within a system or network. These included actors within their respective value chains but also included a range of firms that provide services to, or markets for, those value chain actors. Each involved the introduction of an ‘innovation’ across rather than within a group, bridging groups across different functions in the value chain. Each described factors that either accelerated or slowed down the transfer of the innovation from one group to another – such as in Zambia, where the presence of a drought influenced the take-up of localized agro-dealer agents and community agro-dealer-run companies. In RDCP II in Rwanda, the ‘innovation’ was a policy, and reminds us of how quickly the status quo can change when policy changes or policy constraints are lifted. In Ghana, ADVANCE II had such an active level of copying and crowding in by actors who were not directly supported by the project that it suggests that the particular innovation - a change in the nature of the relationship between smallholders and middlemen - had likely reached the point where the forces supporting change had outweighed the advocates of the status quo.

The presence of all of the elements that enable an innovation to become systemic (such as disrupting the status quo in a set of processes, norms, relationships; working through local actors; introducing an innovation that bridges groups, etc) does not ensure that the change has become systemic. The authors of the four case studies, therefore, also looked for evidence that each of the four interventions demonstrated one or more steps in the process of change becoming systemic, as evidenced by the level of ‘buy-in’ by project stakeholders. These steps, while difficult to quantify, represent the sequence from introduction of an innovation to evidence of broad use and adaptation of the innovation - evidence that it had become systemic.

**Table I.**

Evidence of Buy-in	Naatal Mbay	ADVANCE II	PROFIT +	RCDP
Satisfaction	✓	✓	✓	✓
Continued use	✓	✓	✓	✓
Adaptation of the model		✓	✓	
Further Investments	✓	✓		✓
Replication	✓	✓	✓	

As elaborated more fully in Section III, all four cases illustrate evidence of customer satisfaction and continued use by its intended clients (which is context specific, but includes farmers, processors, SMEs, etc). Naatal Mbay in Senegal demonstrated all the steps except for evidence of adaptation of the model. This is not surprising because in this case, the innovation was

<sup>3</sup> See MarketShare Associates, 2016. *Disrupting System Dynamics: A Framework for Understanding Systemic Change*. [www.microlinks.org/library/disrupting-system-dynamics-framework-understanding-systemic-changes](http://www.microlinks.org/library/disrupting-system-dynamics-framework-understanding-systemic-changes).

<sup>4</sup> Throughout this document, “project” is used in the generic sense to refer to donor-funded activities, rather than the USAID-specific definition of this word.

buy-in by multiple actors into a common price discovery process; adaptation would mean non-acceptance of the innovation. ADVANCE II showed strong evidence of all steps in the process including broad replication of at least parts of the upgraded relationship between aggregators as service providers and smallholder farmers. RCDP II did not evidence adaptation either and for the same reason. The innovation - the introduction of dairy standards - could only be adopted. Adaptation to the standards would have meant rejection of them; however, businesses up and down the value chain did have to adapt their business models and practices in order to respond to these emerging quality norms.

In Zambia, PROFIT + is a unique case that illustrates several of the key stages towards systemic change, with wide adaptation of the model. It also illustrates the role of the external environment in the rate of adoption of an innovation. In the PROFIT+ case, two seasons of severe drought led participating stakeholders to make use of the innovation, in this case the placement of community level agro-dealers (CADs), but not as the project had initially intended. Instead of sourcing high cost, high yielding seed, fertilizer and crop protection inputs for their maize plots consistent with the vision of the project, smallholders used the CADs to source vegetable seeds and inputs for small livestock rearing. Initial analysis suggested that farmers able to access a range of inputs from retailers in their own village were demonstrating greater resilience to the drought conditions by diversifying their activities and avoiding the financial risk associated with high yielding maize seed, favoring recycling of their old seed instead.

# I. BACKGROUND

Feed the Future (FTF) has made significant progress in providing technologies, market opportunities, and nutritional approaches to large numbers of rural people in FTF focus countries. However, FTF has a greater ambition than developing good service delivery models. USAID’s interventions are often designed to facilitate the creation of new market opportunities, farmer-market linkages, or channels for seed and fertilizer delivery, that—if successful—are “self-replicating” with no additional implied financial burden on either donor or host government. These “self-replicating” changes occur largely by identifying and facilitating new opportunities in which for-profit actors—whether traditional traders, or seed suppliers, or nucleus farm owners—are facilitated in taking advantage of new market opportunities that increase their own profits by opening up new opportunities for poor rural people. The motivation for the case studies, therefore, is to dig deeper than simple FTF results reporting, and identify, describe, and analyze strong case studies of FTF value chain programming significantly contributing to systemic change.

## A. Objectives of the Study

The objective of this study was to support USAID’s Bureau for Food Security (BFS) to (i) identify countries or regions where USAID has been instrumental in promoting systemic change; (ii) document in case studies the importance and if possible the impact of that systemic change; (iii) document in the same case studies factors and processes that led to systemic change; (iv) based on these case studies, suggest implications for future programming, including possible metrics for measuring systemic change; and (v) prepare short (one page or less) “success story” versions of each case study that both identifies the systemic change and its impact and—by telling the story of one or more poor rural people who have benefitted—puts a human face on articulating the “systemic change” approach of FTF.

The metrics element of the fourth objective was subsequently addressed more thoroughly in two companion LEO publications: *Guidelines for Monitoring, Evaluation, and Learning in Market Systems Development* and *Disrupting System Dynamics: A Framework for Understanding Systemic Change*<sup>5</sup>. As such, it was not an explicit focus of these case studies.

## B. Methodology

The four projects profiled in this report were identified by USAID and recommended to LEO to include in this study. Following this, the research team then collected and reviewed relevant project documents (e.g. annual performance reports, work plans, results reports, etc), had discussions with project management, technical staff, and associated USAID contacts, and then prepared for field research, which generally took place between May and August 2016, lasting 1-2 weeks in country.

Field research for each of the four cases involved interviews with the key actors to identify indications of buy-in and imitation, as well as focus group discussions with key beneficiary groups to ascertain change in resilience (approximated through diversification of crops) and welfare from adopting innovations and forming new relationships. Post-field work, these case studies and the overarching synthesis were then drafted. A webinar<sup>6</sup> was hosted on September 8, 2016 to preview key findings and solicit feedback from the general practitioner community.

### Identifying and Measuring Systemic Change

As discussed in “*Evaluating Systems and Systemic Change for Inclusive Market Development*” (Dunn and Fowler, 2014) published by USAID through the LEO project, there is no agreement about how to define systemic change. Definitions include:

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<sup>5</sup> Both reports are available at [www.microlinks.org/leo](http://www.microlinks.org/leo).

<sup>6</sup> For a recording of the webinar and slides, visit <https://www.microlinks.org/facilitating-systemic-change-insights-feed-future-programs-rwanda-senegal-ghana-and-zambia>.

“[S]hifts in patterns (similarities and differences) of system relationships, boundaries, focus, timing, events and behaviors over time and space.” (Parsons and Hargreaves, 2009)

“Transformations in the structure or dynamics of a system that leads to impacts on large numbers of people, either in their material conditions or in their behavior.” (Osorio-Cortes and Jenal, 2013)

“Change in the underlying causes of market system performance – typically in the rules and supporting functions – that can bring about more effective, sustainable and inclusive functioning of the market system.” (DFID and SDC, 2008)

“Systems are groups of agents that interact with each other, producing emergent patterns of collective behavior. They are dynamic – constantly changing – as agents are constantly acting, producing emergent patterns that in turn influence individual behaviors in a never-ending feedback loop. Because systems are constantly changing, “systemic change” refers to the diversion of a system down a new evolutionary path, not the introduction of movement where there was none previously (there is always movement). We can observe indications that systems are changing at two levels: behavior changes and characteristics of individual agents (e.g. people, businesses, other market actors); and collective shifts in interactions between individual agents. Systems are constantly changing in both positive and negative ways. For the purposes of market systems development, positive systemic changes result in more sustainable, inclusive benefits to agents in the system.” (MarketShare Associates, 2016).

These and other definitions of systemic change emphasize the need to change the underlying structural elements of a system. These may include institutions, policies, behavioral norms, and perceptions. The Donor Committee for Enterprise Development (DCED, 2014) further identifies three characteristics of systemic change: *scale* (“Systemic changes influence and benefit a large number of people who were not directly involved in the original intervention”), *sustainability* (“Systemic changes continue past the end of the programme, without further external assistance”) and *resilience* (“Market players can adapt models and institutions to continue delivering pro-poor growth as the market and external environment changes”).

In addition, this report posits that a social or economic system in which systemic change has taken place should be fundamentally different as a result of the change, i.e. *transformative*. While systemic change can be positive, neutral, or negative, at least for some of the actors in the system, development practitioners aim for these observed changes to contribute to positive development outcomes, manifesting in the increased resilience and or welfare of individuals and communities. Finally, systemic change is inherently *disruptive*. In order for change to become systemic, it must ‘disrupt’ a status quo whether in the relationships, rules, processes, technologies, network, norms and or behaviors of actors within a system to the point where the forces favoring a change exceed those seeking to maintain it. These two particular characteristics are explored further in the next section.

In conducting these case studies and profiling examples of systemic change, these various unifying elements of systemic change were incorporated. In capturing indications of change, as presented above, this research focused on those presented in Fowler and Dunn, 2014: buy-in, and imitation.

## II. SPOTLIGHT ON INNOVATION: A THEORY OF CHANGE FOR SYSTEMIC CHANGE

Building on the findings from the four case studies, as well of the broader body of literature on the topic of systemic change, this paper posits the following theory as it relates to how systemic changes occur:

*Innovations introduced within a system become self-replicating and capable of disrupting a status quo without further external force, ergo systemic, through the transfer of an innovation between groups characterized by weak ties between them. Innovations are spread across ‘bridges’ from actors with prior knowledge of a new process, practice, technology or behavior, however recently acquired, to actors who would benefit from adopting it. The*

*rate of adoption of innovations is determined by characteristics of the individuals forming the bridge, social norms and customs, and environmental (physical, climate, and business enabling) factors. Members of a group or network may replicate and adapt innovations without external support once said innovation is adopted by 16-20%<sup>7</sup> of their members.*

In reviewing the literature on systemic change, innovation diffusion and the review of the four case studies included in this paper, the authors formulated a theory of change that should guide the design and implementation of any projects leveraging the power of private sector actors to disseminate innovations on a sustainable and systemic basis.

A social or economic system in which *systemic change* has taken place should be fundamentally different as a result of the change. While change can be positive or negative, innovations in rules, norms networks, or processes in order to achieve donor identified objectives, should result the greater resilience and or welfare of individuals and communities affected by this change. Thus as stated above, in order for change to become systemic, it often will ‘disrupt’ a status quo. In many cases, change becomes systemic when the factors supporting a new evolutionary path overcome the factors supporting the status quo. While never neutral, because the end game must be significantly different from the *status quo ante*, it can be good or bad for some participants in a system. Importantly, systemic change can occur with or without an external intervention.

Much of the literature around systemic change in market development begins its analysis phase *after* the introduction of an innovation. Yet, as a complement, a comprehensive theory of change must begin sooner in the change process and identify where the end is of any need for continued subsidy or support to accelerate and render systemic a desired change.

While systemic change can be positive or negative, depending on the power within a system to protect or overturn an inefficient status quo, innovation, at least in this context, refers to change that results in higher economic and social benefits and is therefore a positive force. Part of the systemic change challenge is that innovation begins with an agent from within or outside a system, with the motivation to disrupt a status quo in norms/rules, networks, product, information or service flows, and ends with a large enough mass of actors adopting an innovation to ensure that forces favoring the new condition have surpassed forces invested in maintaining the status quo. A compelling theory of change must begin with the conditions that cause an agent or agents to disrupt the status quo, a method for the identification of those individuals and their motivation, the mechanism by which innovations are spread, and ultimately, a determination of the tipping point beyond which the forces of change have surpassed those favoring the status quo. It is at this last point that subsidy or support is no longer required, at least for a particular innovation.

**Innovation:** the introduction of new products, rules, norms, organizational models or networks of actors in order to generate inclusive economic growth and/or social benefits. **Economic growth** is the optimization of the utilization of factors and the measure of success is how well the factor utilization is optimized.

This TOC therefore, needs to answer several questions. It must be able to explain most if not all cases of introduced innovation becoming systemic for objectives from resilience to economic growth and across multiple environments. It must address how in the process of becoming systemic, it acquires momentum and becomes self-replicating. At the very least the TOC<sup>8</sup> must answer the following questions:

1. How do we identify system actors motivated to disrupt the status quo by innovating within a system?
2. How is the innovation spread beyond the innovator to adopters?
3. What are the factors that affect the rate at which innovation occurs and the rate at which said innovation is taken up by other actors?

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<sup>7</sup> This hypothesis is based on assumptions from innovation diffusion theory (Rogers, 1962), which posits that once the innovators, the early adopters, and the early majority of a cohort, change their behavior, the remainder of the set of the early and late majority will observe and adopt the new behavior of their own volition.

<sup>8</sup> A distinction should be made between a theory for how change occurs, which the synthesis of these studies is attempting to do, and a theory of how a change process is integrated into networks. The latter is much more dynamic but outside the scope of this report.

4. How do we measure progress from the introduction of an innovation to the point at which the introduced change becomes systemic? What are the observable steps in the adoption and replication process, and;
5. How long will it take and what percentage of a population do we have to reach before an innovation has become systemic and we can move on to the next thing?

Elements of this process have been identified and integrated in previous LEO materials, notably the concepts of leverage and momentum, comfort and learning zones and the diffusion theory bell curve<sup>9</sup>. Our TOC will draw from a literature review on both systemic change and on the introduction and diffusion of innovation. The remainder of this section provides a theoretical foundation for each of the above questions.

1. *How do we identify system actors motivated to disrupt the status quo by innovating within a system?*

Market facilitation approaches often emphasize tactics that enable buyers and sellers to learn to cooperate more effectively<sup>10</sup>. But who among the potential large set of vertically linked firms is likely to introduce or be receptive to introduced innovation? Mark Granovetter in his seminal work the *Strength of Weak Ties*<sup>11</sup> and the *Strength of Weak Ties: A Network Theory Revisited*<sup>12</sup> describes the innovator in a system as "the innovativeness of [actors] is shackled by vested intellectual interests (or perspectives) then new ideas must emanate from the margins of the network."

Otherwise stated, membership in groups (such as an association of traders, processors, input companies or farmers) tends to stifle innovation, maintaining an internal status quo. This is one reason that donor-funded entities so often introduce innovation, as they are external to any networks within the market system. But external introduction of innovation is a one-off activity. The implication for a development partner is that innovation must be introduced through an actor who is somehow *marginal* to the group in which they participate. An actor, whether a miller, an input supplier, or a wholesaler, becomes marginal to a group or network when she/he faces incentives to overcome a status quo situation. She/he might be trying to capture market share from other members of her/his group, be a member of a different ethnic group than others, have a different educational level or other factors that predispose her/him to overcome a status quo condition. With some exceptions, the actor in a group with the greatest market share will be less inclined to innovate; their investment in the status quo has worked well for them so far.

2. *How are innovations spread beyond the innovator to adopters?*

Once the challenge of selecting a firm or firms with the incentives to introduce an innovation, the systemic change program must identify to whom a particular technology should be introduced. Many programs continue to try and train as close to 100% of a targeted population as possible for social equity reasons. This approach tends to be costly, and less effective than those that target assistance to individuals most likely to adopt a particular technology and disseminate that technology within her or his group. Here the notion of bridges as described by Granovetter is important<sup>13</sup>. Bridges are weak ties between members of two unlike groups, one who has access to information and or technologies of value to the other and the incentives to disseminate; the second, who is more disposed than other members of her or his group to test, and if successful, adopt the new technology (see figure 1). In the context of the four cases in this paper the holder of innovation could be a processor, an input or veterinary services provider, a lead firm, or nucleus farmer or outgrower business. In some instances, an individual can serve as a bridge between two groups. The outgrower businesses (OB) in the ADVANCE II project are an illustration of this.

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<sup>9</sup> Rogers, Everett M. 2003. Diffusion of innovations. New York: Free Press

<sup>10</sup> For more on the facilitation approach, see [www.microlinks.org/good-practice-center/value-chain-wiki/facilitation](http://www.microlinks.org/good-practice-center/value-chain-wiki/facilitation). LEO has also produced a number of program-focused learning tools that build capacity in staff to apply the facilitation approach and specific intervention tactics. See [www.microlinks.org/library/market-systems-development-cartoon-based-learning-tools](http://www.microlinks.org/library/market-systems-development-cartoon-based-learning-tools).

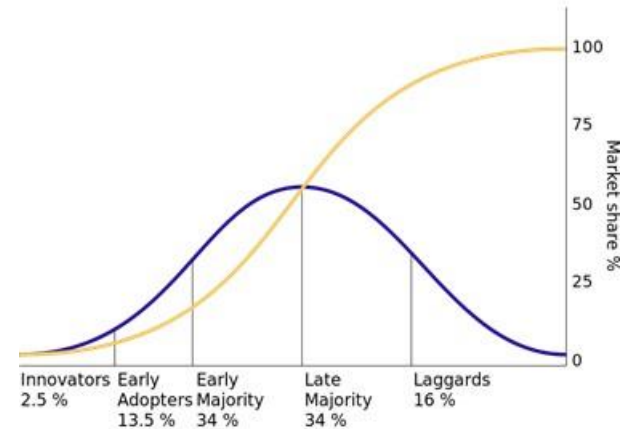
<sup>11</sup> Granovetter, Mark, The Strength of Weak Ties (1973). American Journal of Sociology, Vol. 78, Issue 6, p. 1360-13 1973. Available at SSRN: <http://ssrn.com/abstract=1504479>

<sup>12</sup> Granovetter, Mark, The Strength of Weak Ties: A Network Theory Revisited, (1983). Sociological Theory, Vol. 1 (1983), pp. 201-23

<sup>13</sup> Idem

To effectively use limited resources, the firm introducing change must identify whom in a receiving group is most inclined to adopt and if successful, disseminate within her/his own group.

Here diffusion theory is helpful. Diffusion theory posits that within any group or network, members of the group respond to, and adopt innovations differently. Members can be classified as innovators, early adopters, early and late majorities and laggards. Surprisingly the distribution of a population around these types is remarkably consistent across types of networks, culture, age, etc. Innovation diffusion theory<sup>14</sup> states that approximately 2.5% of any population are predisposed to innovate (e.g. try new technologies, before they have observed the results). Innovation diffusion theory suggests that a program can be more effective when it identifies the innovators with from within a network, introduces a new, or bolsters an existing, innovation, and supports innovators in disseminating (e.g. ‘diffusing’) this innovation to other members of her/his network. The community agro-dealers (CAD) in the Zambia PROFIT+ project illustrate this, but so does any bridge between a private actor who has successfully identified the innovators with in any group to which she/he wishes to introduce a technology. Innovators within a group are not difficult to identify because most of the members of a group or network already know who they are. Market system development programs aiming to facilitate systemic change should take care to ensure that members of the group identify the innovators and that they function as one side of the technology transfer bridge; this can both save resources and accelerate the diffusion to the larger group.



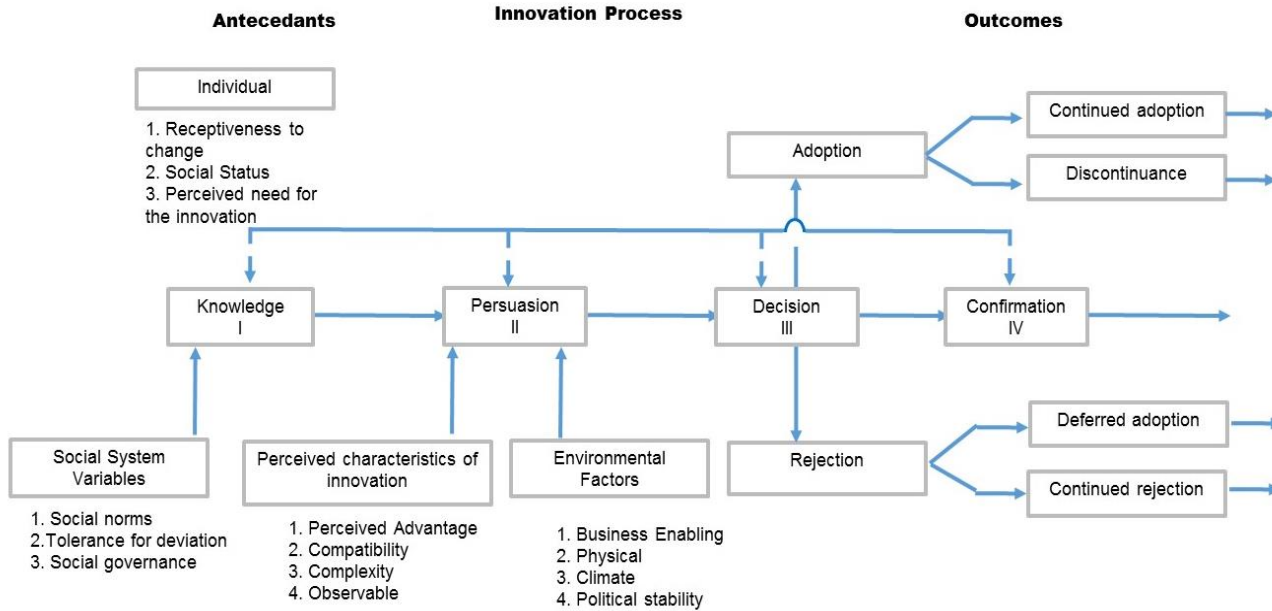
**Figure 1: Diffusion Theory Bell Curve**

3. *What are the factors that affect the rate at which innovation occurs and the rate at which said innovation is taken up by other actors?*

Each of the four cases in this study illustrate key elements of systemic change. Each however varies by the level and rate of copying and crowding in by actors not directly supported by the particular project. We assume that the rate of adoption of innovations, and importantly for systemic change, the rate of imitation and crowding in by other actors, will vary from case to case. But why? And are there ways to change, i.e. accelerate change within a system?

Rogers (1995) developed a model for the adoption of innovation within a system that illustrates the variables in this process (see figure 2). These include individuals, social systems and perceptions about a particular innovation. All four projects in this study intervene at the individual level using strategic subsidies, cost sharing grants, as well as heightened recognition and activities to elevate her/his status from adoption, to positively affect the individual’s (innovator) uptake of innovation. Likewise, programs use demonstrations to increase an individual’s perception of an innovation; demonstration plots and field days are a common mechanism to achieve this. An additional factor, not included in Roger’s framework but important in a developing economic context and illustrated in the four cases in this study are environmental factors. Included in environmental factors are the physical, political, economic, and climate.

<sup>14</sup>Rogers, Everett M. 2003. Diffusion of innovations. New York: Free Press.



**Figure 2: Rogers' Model for Adoption of Innovation in a System**

Each of the four cases provides strong evidence of systemic change each was affected by, or importantly, had an effect upon, the environment. The Rwanda dairy case is an illustration of how the introduction of standards resulted in an industry policy change that in turn affected the adoption of standards across the whole industry. The Zambia case illustrates how in the face of persistent drought the rate of innovation adoption is slowed, even while strengthening the resilience of current adopters; in the absence of drought conditions, Zambia might be expected to demonstrate a higher level of adoption, imitation and crowding in. Ghana and Senegal experience relatively normal rainfall patterns; both countries suffer from an absence of a robust private sector seed market and low levels of high quality seed use<sup>15</sup>. Yet the rate of imitation and crowding in by multiple private sector actors in Ghana seems significantly higher than in Senegal. Since imitation concerns actors not directly targeted by the project, this difference cannot be attributed to differences in management or implementation. Imitation behavior by actors not directly supported by the project are exogenous to differences in management.

The causes of this difference are beyond the scope of these studies to determine; one hypothesis is that the difference is due to the business enabling environment. A quick comparison of the World Bank's *Doing Business* indicators (see table 2) shows much lower ranks for the Rwanda and Zambia, but also shows a 20-point difference in Ghana's favor over Senegal; lower scores reflect more ease in doing business.

**Table 2. Ease of Doing Business**

Country	Ease of Doing Business Rank
Rwanda	62
Zambia	97
Ghana	114
Senegal	153

Source: [www.doingbusiness.org/](http://www.doingbusiness.org/)

Innovation diffusion theory is useful at identifying where a project can intervene to accelerate the adoption of innovation as well as understanding factors outside of the project's control that will affect the rate of adoption and dissemination of a particular innovation. Weaknesses of the model, however, are in its failure to describe what happens when innovations are not taken up and how to mitigate this. Figure 3 below lays out empirically observable steps in the innovation acceptance and diffusion process.

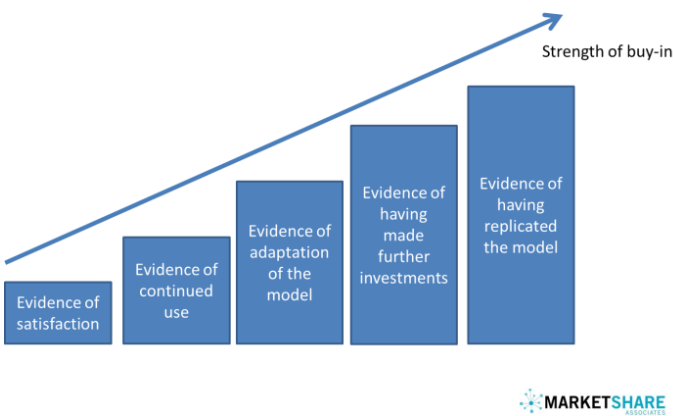
<sup>15</sup> The Senegal Naatal Mbay project is implementing a seed multiplication activity but it is too early to assess the effectiveness of this intervention at lifting the seed availability constraint for large numbers of farmers.



4. *How do we measure progress from the introduction of an innovation to the point at which the introduced change becomes systemic? What are the observable steps in the adoption and replication process?*

Figure 3 lays out a five step process to assess progress towards buy-in, which is one key indication of systemic change. These steps can be built into a program’s internal M&E system, permitting users to monitor progress towards buy-in as it is taking place. Progress towards and beyond each of the five steps can be monitored using qualitative data collection techniques. If weak ties bridges identified above reject an innovation or there is no evidence that the network or group is investing in the innovation, project staff can dig deeper to understand why and to modify implementation strategy based on what they find when they dig.

5. *How long will it take and what percentage of a population do we have to reach before an innovation has become systemic and we can move on to the next thing?*

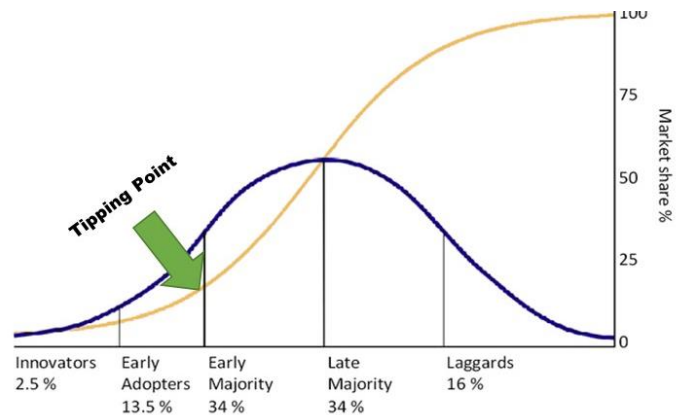


**Figure 3. Scale of Evidence of Buy -In**

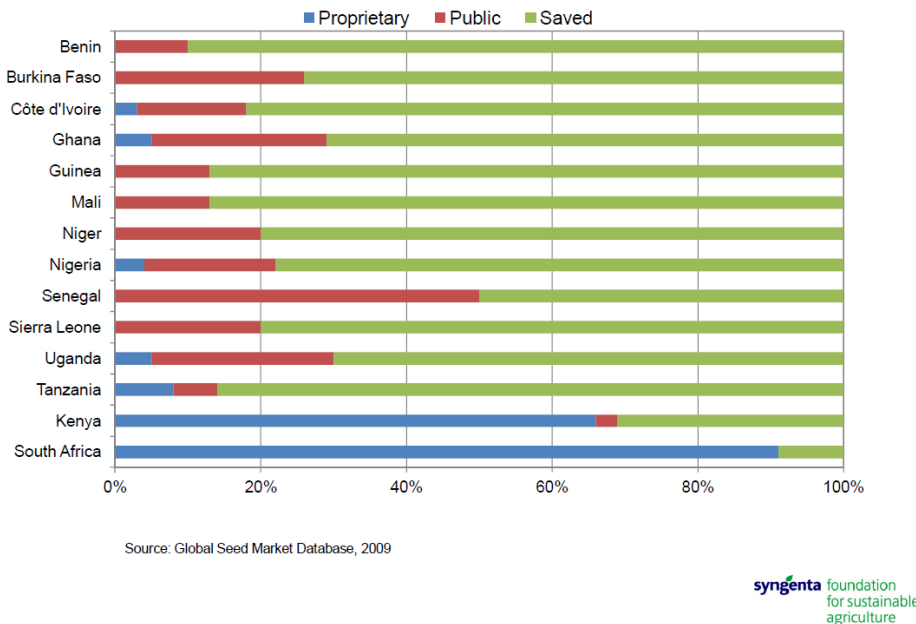
would continue to spread. Empirical, post-project research is needed before this theoretical tipping point can be confirmed in the field.

Figure 4 below and basic calculus would suggest that the ‘tipping point’ occurs where the slope of the blue curve changes from concave to convex to its origin - or when the early majority begins to replicate the behaviors of the early adopters. If this is indeed the case, the targeted results of many market systems development programs in terms of outreach are excessive – in other words, projects only need to aspire to outreach targets that approximate the ‘tipping point’, not canvas the entire population. There are also numerous factors that break ties between one subpopulation and another; this phenomena, if established would warrant interventions in which the tipping point was achieved within two or more subpopulations, with the expectation that the status quo was overcome and the desired change

Rogers<sup>16</sup> diffusion of innovations graph illustrates Malcolm Gladwell's tipping point notion. Once innovators and all the early adopters have tried, adapted and replicated a new innovation for their own benefit, other members of their group or network will follow suit, so long as the resources required to adopt a given innovation are still available. This is what Malcolm Gladwell refers to as the 'tipping point.' Beyond this point, if members of the early majority have the same access to the bundle of services that the innovators and early adopters had, they should, in principle, go out and invest in the same innovation. This of course assumes that actors who are part of the early majority can access that bundle of goods and or services under the same terms and conditions. This point of inflection in the adjoining figure occurs after when approximately all early adopters (i.e., 16-18% of a population) have adopted and are replicating a particular innovation. From a development resource management perspective, beyond this point, funds invested to ensure wide adoption of a particular change within a particular environment may not be necessary. This needs to be tested empirically of course. An exception to this hypothesis is if the ties between subgroups of a population lack bridges (see above). This can occur among groups in conflict or severe isolation from one another.



**Figure 4. Innovation Diffusion and Tipping Points**



**Figure 5: Improved Seed Uptake in Sub Saharan Africa**

This appears to be supported by the uptake of improved seed by farmers. Figure 5 illustrates uptake of improved seed by farmers in a number of Sub-Saharan countries. In this graph, use of improved seed by country shows a significant cluster at or below 20% and use of private proprietary seed far lower. Three countries, however, Senegal, Kenya, and South Africa, have uptake of improved seed at or above 50%. There are many variables in play in this graph but in West African markets, use of improved seed barely reaches 5%, and seed markets flounder; in most of the COMESA countries, hybrid seed use has surpassed 20% and these markets are growing, mostly without external subsidy.

From this theoretical foundation and an evaluation of the four cases we can hypothesize a Theory of Change for Systemic Change as:

*Innovations introduced within a system become self-replicating and capable of disrupting a status quo without further external force, ergo systemic, through the transfer of an innovation between groups characterized by weak ties between them. Innovations are spread across 'bridges' from actors*

<sup>16</sup> Ibid

*with prior knowledge of a new process, practice, technology or behavior, however recently acquired, to actors who would benefit from adopting it. The rate of adoption of innovations is determined by characteristics of the individuals forming the bridge, social norms and customs, and environmental (physical, climate, and business enabling) factors. Members of a group or network may replicate and adapt innovations without external support once said innovation is adopted by 16-20%<sup>17</sup> of their members.*

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<sup>17</sup> This 16%-20% figure requires additional empirical testing.

# III. COUNTRY CASE STUDIES

## A. SENEGAL: SYSTEMIC CHANGE CASE STUDY ON NAATAL MBAY

### SUMMARY

Naatal Mbay is a large-scale, market systems development project targeting the rice, maize, and millet value chains in the Senegal River Valley and the South Forest Zone. This case study highlights two key areas in which the project is facilitating changes at a systemic level: revamping the prevailing *contract farming* system in paddy rice by introducing a more inclusive, competitive model, and introducing *agricultural equipment leasing* into a new geographic area, tailored for a new category of clients (millers and processors).

**About the project:** Naatal Mbay is the successor to the Project Croissance Economique (PCE), which was launched in April 2009 and ended in May 2015. PCE focused on the rice, maize and millet value chains, targeting the Senegal River Valley for rice produced under irrigation, and the South Forest Zone surrounding the Gambia for maize, millet and rain fed rice. Naatal Mbay's focus is to scale-up successful technologies and approaches developed under PCE. The project is managed by Engility Corporation and runs through February 2019, with a budget of \$24 million. Naatal Mbay continues to focus on the rice, maize and millet value chains in the Senegal River Valley (SRV) and the South Forest Zone with the objective of reaching more than 50% of a target population estimated at 330,000 households.



### **Key findings** include:

- There are signs the contract farming model as a whole is becoming increasingly adopted. The 3 processors interviewed for the study are now supporting over 3,000 smallholder farmers annually, compared to approximately 400 that they used to support before. Additionally, 20 processors and small-scale millers are participating in the system, allowing for in-kind reimbursement, with over 55,000 tons of paddy worth \$12 million estimated by the project in the 2016 dry cropping season.
- Moreover, the amount of credit available in the system has similarly increased substantially, and there has been crowding-in by other financial institutions to finance rice contract farming at a variety of levels. Building from one partner - CNCAS - which financed the millers and farmers, three other microcredit institutions are now in the market, with a fourth in discussions. CNCAS estimated that the total credit volume that it is allocating for rice cultivation has approximately doubled, from \$6 million prior to the project to \$12 million currently. Locafrique and BNDE have also entered the market, lending to millers to purchase paddy rice. Locafrique has already made loans of \$1 million and intends to triple that amount in 2016. BNDE also has programs of this magnitude.
- None of the market actors involved in the machinery leasing model have discontinued their participation. Rather, most actors have actually expanded their operations. To be profitable, processors need enough quality rice for their newly acquired rice mills to operate for at least eight months. Farmers are reliant on credit, and so are keen to demonstrate their creditworthiness. Millers all plan to support more farmers in order to pay back the cost of their equipment to Locafrique. This has given the millers a vested interest in making the system work.
- Locafrique represents the most significant case of potential adaptation of the initial model introduced by Naatal Mbay. They have adapted their product offering to leasing larger agricultural equipment like rice millers, and now plan to convert into a bank that will offer working capital financing to actors in the rice sector. Locafrique has also sourced new lines of credit at more favorable rates to be able to reduce the interest rate that it is charging its clients in the SRV.

- Beneficiary clients report significant satisfaction with the business model – one indication of buy-in. The equipment leasing provider, Locafrique, is satisfied with the system and recognizes that Naatal Mbay played a significant role in its decision to begin offering these services. Similarly, the millers and processors are satisfied with the terms on which they got their processing units. They feel certain that they will be able to repay their loans. CNCAS, a semi-public bank, is satisfied with the system since they are being paid on time by their borrowers.
- There has been ongoing investment by all actors involved in equipment leasing, with little direct involvement by Naatal Mbay. Locafrique has continued to invest in its business expansion throughout the partnership with Naatal Mbay, including through the opening of a permanent office in Saint Louis to manage its leasing operations. This has occurred without ongoing subsidy by Naatal Mbay.
- As opposed to the equipment leasing initiatives, the ongoing role of subsidies by Naatal Mbay for extension in the contract farming model raises concerns. Ideally subsidy would be reduced, weaning the subsidized provider and allowing for other actors to enter.

## CONTEXT

Senegal covers an area of nearly 200,000 km<sup>2</sup> and has a tropical semi-arid climate. According to IFAD, despite good economic performance and sustained growth over recent years, the standard of living of the median Senegalese remains low. Low agricultural productivity, the failure of the economy to generate employment growth in other sectors, and inadequate resources allocated to social services all contribute to systemic poverty. An estimated 46.7 percent of the population in 2010 lived below the poverty line of 2400 kCal per person per day in food consumption.<sup>18</sup> This proportion is much higher in the countryside, where three quarters of the poor reside. With a gross national income (GNI) per capita of \$1040<sup>19</sup>, a life expectancy of only 66.7 years (64.6 male, 68.6 female)<sup>20</sup> and an overall literacy rate of 49.7 percent of the adult population (61.8 percent male, 38.7 percent female)<sup>21</sup>, Senegal has a 0.466 Human Development Index score for 2015 and ranks 170th of 180 countries<sup>22</sup>. Poverty in Senegal is concentrated in less fertile rural areas, including Louga, Northern Diourbel and areas outside the river valley region.

## PROJECT STRATEGY

This section looks at two distinct components of Naatal Mbay's strategy for fostering systemic change, as well as the findings about the level of systemic changes observed. These two components are contract farming and equipment leasing. While it is too early to determine how systemic and enduring the change with the three initiatives is, the project has analyzed each area and is taking steps to support innovations becoming systemic.

### SYSTEMIC CHANGE AREA I: CONTRACT FARMING

#### Project Strategy

Introducing a new model for contract farming is Naatal Mbay's most prominent intervention, and arguably has generated the most impact from among all of its interventions. Hence including it in the assessment of systemic change was critical. The contract farming intervention was launched to significantly reduce the risks, difficulties, conflicts, and uncertainty of procuring rice on the open market and consequently to increase farmers' incomes.

The contract farming model promoted by Naatal Mbay has the following characteristics:

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<sup>18</sup> Government of Senegal, Senegal Poverty, inequality and gender: an overview. 2012. [http://www.gcsenegal.gouv.sn/docs/GC2014-012%20Poverty%20Note%20%201\\_Overview\\_final%20Englishn.pdf](http://www.gcsenegal.gouv.sn/docs/GC2014-012%20Poverty%20Note%20%201_Overview_final%20Englishn.pdf)

<sup>19</sup> Gross national income (GNI) is defined as the sum of value added by all producers who are residents in a nation, plus any product taxes (minus subsidies) not included in output, plus income received from abroad such as employee compensation and property income. [http://www.unicef.org/infoby-country/senegal\\_statistics.html](http://www.unicef.org/infoby-country/senegal_statistics.html)

<sup>20</sup> <http://www.worldlifeexpectancy.com/senegal-life-expectancy>

<sup>21</sup> [www.indexmundi.com/senegal/literacy.html](http://www.indexmundi.com/senegal/literacy.html). 2009.

<sup>22</sup> The Human Development Index (HDI) is a composite statistic of life expectancy, education, and income per capita indicators, which are used to rank countries into four tiers of human development. <http://countryeconomy.com/hdi/senegal>

- Contracts are signed between farmers, a processor and a bank (either together or separately) to govern the distribution of credit. Raw material norms and standards and testing technologies are included in the contract annexes.
- An annual meeting is held immediately before harvesting during which the selling price of the paddy rice is agreed by farmer representatives, governmental bodies, buyers, millers, equipment dealers and insurance companies. The negotiated price serves as a basis for the agreements between farmers and service (and goods) providers.
- Banks and millers both lend to farmers and receive either paddy or cash in payment. Although loans are provided individually, they are guaranteed by the farmer association as social collateral.
- All the actors in the chain (lenders, processors, service providers) accept to be paid by farmers in paddy rice based on the aforementioned price. Non-miller service providers who are paid in paddy rice sell the rice to millers to convert their payment to cash. Millers also take loans in paddy from the banks based on the agreed-upon paddy selling price, and repay in cash after processing the paddy and selling the rice.
- Farmers are only required to repay their lenders with a quantity of paddy or milled rice sufficient to clear their debt (i.e. fractional selling). They are free to market any surplus inside or outside of the contract farming scheme.
- Rice accepted as payment by the bank is managed by an independent warehouse manager, who ensures that all rice meets required quality standards.
- All borrowers (farmers and millers) must purchase crop insurance, which is provided by a government-subsidized entity.
- Extension agents employed by processors and Naatal Mbay's partners (either apex farmers associations or farmer associations) train lead farmers from within the farmers groups on good agricultural practices (e.g., production, processing, storage). The lead farmers are then expected to train their fellow group members. The expectation is that the training content will reach every farmer in the target groups.
- Database managers employed by processors and Naatal Mbay's partners (either apex farmers associations or farmer associations) collect and maintain information on the size of each farmer's plot, their physical location (via geo-referencing), farmers' production capacity, and their input needs for each season.
- Apex farmers' associations use the database information to order inputs for their members and coordinate delivery.
- Buyers access the database information to better coordinate the distribution of inputs and crop purchases.
- Processors and the CNCAS bank access the database to assess farmers' production capacity and calculate the size of loan that they are willing to provide.

This model is a modification of the traditional *filière* that is widespread in francophone countries, in which farmers are provided inputs, which the contracting entity (typically tied to the state) deducts from the cost of those inputs (sometimes highly inflated) when it buys the final product. The following table compares the model promoted by Naatal Mbay with a typical *filière* system.

**Table 3**

Aspect	Filière system	Naatal Mbay model
<b>Buyer</b>	There is a single buyer – typically a state entity	Multiple buyers compete to purchase the rice
<b>Repayment currency</b>	Payment made with crop mainly	Payment can be made with crop or cash
<b>Side-selling</b>	Farmers must sell their entire crop to the single buyer	Farmers do not have to sell their entire harvest to the buyer – only enough to clear their crop loan
<b>Repayment value</b>	Price is typically set based on the market value of the crop during the harvest period	A uniform price is agreed immediately before harvest
<b>Quality assurance</b>	Poorly understood by most actors, not widely disseminated	Well understood by all actors; widely disseminated through flyers
<b>Bargaining power/market governance</b>	Monopsonistic; farmers have no bargaining power Only large companies maintain records on production	Market based; producers can sell to any of multiple buyers competing for product Redundancy is purposely built into the system: all actors (including farmers associations) maintain

	records on production and draw on these during negotiations
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The following results chain presents the anticipated change process from Naatal Mbay's contract farming model. The anticipated intervention results assume that a robust contract farming system will contribute to increasing participating rice farmers' yields, product quality and profitability<sup>23</sup> and that the participating value chain actors will continue to expand upon this model without external subsidy beyond the life of this project. For that to happen, system actors must be able to deliver extension services, inputs, and financing. Reasonably strong farmers associations and geo-referencing allow for accurate estimates of members' production potential and input requirements. With this information, lenders have information on farmers' production potential, and buyers know exactly where farmers are located.

As these changes occur, several systemic changes are expected. As market actors' margins improve, they should increase their buy-in to the contract farming model. More processors, service providers and farmers associations should replicate the contract farming model, and consequently more rice farmers should begin participating.

To achieve the changes outlined in the above results chain, Naatal Mbay's strategy has been to partner with a multitude of actors in the rice value chain, including apex organizations representing farmers associations, the Government of Senegal's regional department in charge of agriculture, banks, insurance companies and managers of irrigated land and extension services (SAED and ANCAR). Naatal Mbay has undertaken the following activities:

- Attracting the interest of the banks and other financial service providers to provide funds to the value chain actors to finance their working capital requirements
- Directly subsidizing 90 percent of the salaries of extension agents (typically three) and database managers (one) for both the processors who are purchasing the rice and for the farmer associations that are managing the coordination of supply
- Encouraging and financing the participation of all stakeholders in the annual price setting meetings
- Inviting the insurance company, CNAAS, to provide insurance to farmers and other actors requesting a loan

In Naatal Mbay, CNCAS participate in the price setting negotiations but the grain is managed by a third party.

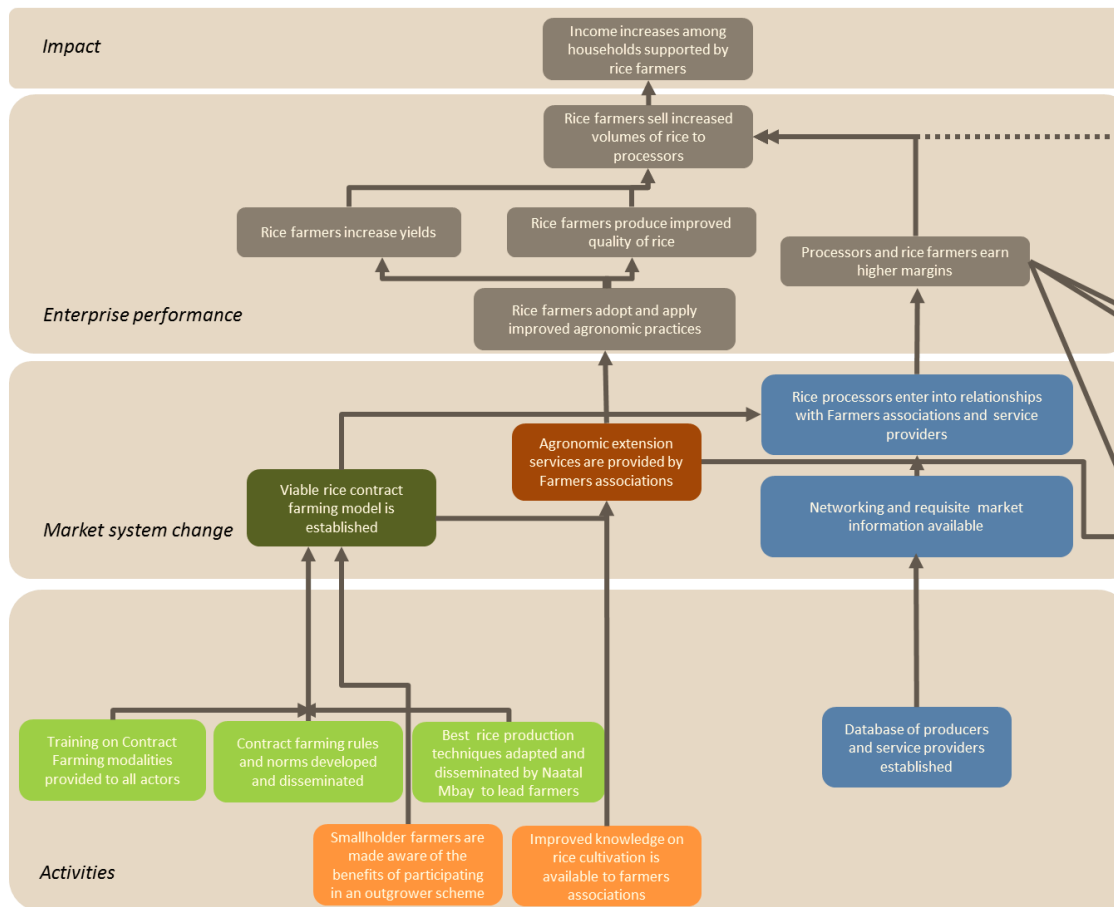
Several critical assumptions underpin Naatal Mbay's contract farming intervention:

- All the actors accept the defined price for the paddy prior to starting production
- All actors agree on the quality of the rice to be sold/monetized and how quality will be measured
- Banks and service providers agree to adapt their business models by accepting payment in kind
- There are no major shocks in international rice markets which would affect the price in the national market

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<sup>23</sup> Profitability also depends on other factors not depicted in the results chain, including that the terms and conditions of the contract farming model do not skew benefits and power relations in favor of the processor.

## CONTRACT FARMING RESULTS CHAIN



## SYSTEMIC CHANGE

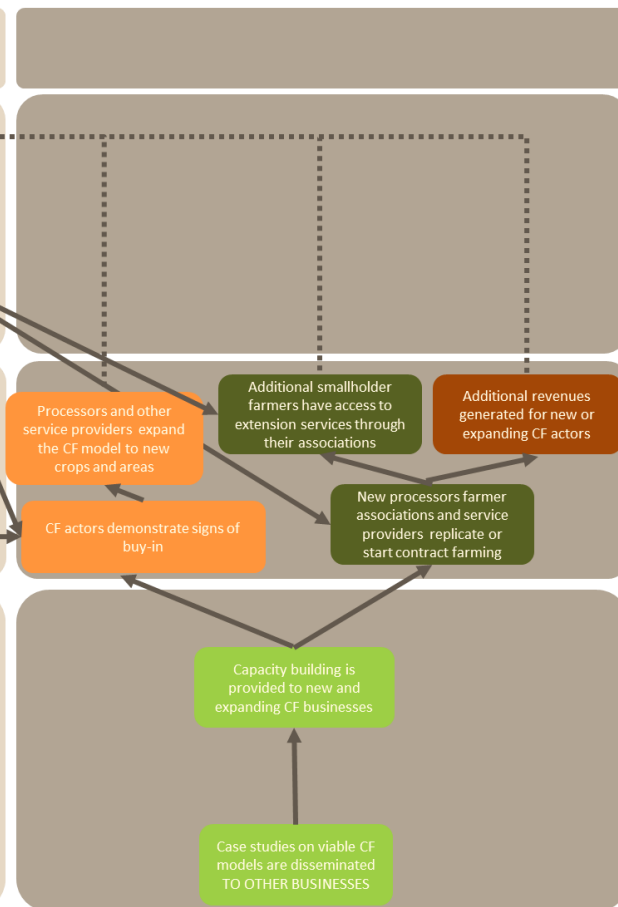


Figure 6. Contract Farming Results Chain



## EVIDENCE OF SYSTEMIC CHANGE

### Imitation

One major area of imitation confirmed during this research relates to financing of the contract farming system. Initially Naatal Mbay worked exclusively with CNCAS to finance the millers and farmers. Subsequently other microcredit institutions joined in, imitating CNCAS in financing rice contract farming. This includes: Credit Mutuel du Senegal, Microcred, and FIDES. Ecobank is also holding discussions with Naatal Mbay about providing finance and leasing services. Recently, Locafrique and BNDE have entered the market, lending to millers to purchase paddy rice. Locafrique has already made loans of \$1 million and intends to triple that amount in 2016. BNDE also has programs of this magnitude. This level of imitation is worthy of note because financial institutions are better known for mitigating risk than for innovating, and it is an indication of the industry's perception of the profitability of this new model for contract farming.

Another area where imitation has begun occurring is amongst processors, who are beginning to adopt the in-kind reimbursement system introduced by Naatal Mbay. In the beginning, Naatal Mbay worked most intensively with three processors and directly introduced the model to each of them. Now, a number of other processors have also started to use the in-kind reimbursement system. The research team was unable, given time constraints, to speak with all of the processors and millers; the project estimates that more than 20 processors and small-scale millers are now participating in the system and that in the 2016 dry cropping season will amount to 55,000 tons of paddy worth \$12 million. The extent to which these actors adopted these behaviors directly because of the project's intervention versus imitating the behavior of others could not be verified.

In some areas, the research team did not find evidence of imitation by non-project partners of project-supported behavior. In some cases, this is because the function cannot easily be replicated given its design. For example, the Government of Senegal currently subsidizes 50 percent of the cost of CNAAS's insurance policies, which would deter other entrants needing to operate on a purely commercial basis. As the shareholders of CNAAS are the major private insurance companies there is the potential that they could enter themselves as the market evolves, but it will not happen at present. Moreover, other associations have not independently adopted the hiring of database managers and extension officers without Naatal Mbay's funding, with the exception of the SFA milling company, which is now paying a stipend for extension services.

### Buy-In

A challenge with assessing buy-in attributable to Naatal Mbay was that contract farming is not new to the Senegal River Valley; actors had already been practicing contract farming prior to the beginning of the PCE project. Naatal Mbay's innovations help the contract farming system function better. Therefore the assessment of market actors' buy-in focuses specifically on the new innovations that Naatal Mbay introduced (e.g., acceptance by banks and other market actors to be paid in paddy rice rather than cash, acceptance by all market actors of a uniform price, linkage of farmer loan reimbursement and miller lines of credit through a grain consignment system, introduction of quality standards and testing protocols as part of the contracting process) rather than their adherence to the contract farming system as a whole. Several elements of buy-in are explored below:

### Satisfaction

All actors expressed satisfaction with the contract farming model. No significant complaints were registered. One point of evidence for this is that more and more farmers are approaching the outgrower businesses to join the contract farming model. CNCAS is also satisfied with the system as its loans to farmers and other actors are being repaid, business is growing and the Senegal River Valley now generates the most business for their company. Another indication of satisfaction is that although farmers only need to sell enough rice to their lender to discharge the value of their loan, many are selling their excess through the same system rather than using the informal markets.

However, satisfaction proved a somewhat challenging indicator to measure, given the direct funding being provided by Naatal Mbay to many of the stakeholders who were interviewed. Consequently, all interviewed stakeholders expressed satisfaction with the support they received but also cautioned that they were expecting support to continue.

## Continued Use

One indication that continued use post-project support is likely is changes in the capacity of the market actors. It was observed that many farmers associations are now sufficiently confident to contact and negotiate with other market actors as needed. More generally, there are signs that the contract farming model as a whole is becoming increasingly adopted. The three processors interviewed for the study are now supporting over 3,000 smallholder farmers annually, compared to approximately 400 that they used to support before. Moreover, the amount of credit available in the system has similarly increased substantially. CNCAS estimated that the total credit volume that it is allocating for rice cultivation has approximately doubled, from \$6 million prior to the project to \$12 million currently.

A leading signal that continued use is likely is that the benefits accruing to market actors are strong. One of the benefits created by the innovations to the contract farming model is that farmers are able to quickly pay off their loan with a single crop delivery. With a fixed price and a guaranteed buyer, they avoid spending significant time negotiating and selling small amounts. This frees up their borrowing room to do double cropping or other investments. Similarly, with millers now selling a better quality product, they have been better able to compete in the market. This has strengthened their profitability and thus improved farmers' confidence that they will be paid.

The actors that were interviewed indicated they were continuing to use the contract farming system and the specific features introduced by Naatal Mbay. In particular, farmers associations, buyers and processors have all continued to employ extension officers and database managers. However, this is a relatively weak indication of buy-in, given that Naatal Mbay has continued to provide a very high subsidy of 90% of the total salary cost. Because project support has not yet ended, the likelihood of continuing use of these specialists without subsidy is not fully clear. An examination of capacity suggests that the buyers and processors, as well as some of the larger apex farmers associations, are more likely to continue to do so. They have the financial capacity to afford the salaries of these positions, whereas the smaller farmers associations will struggle to do so (the total cost of the four positions, approximately \$500 per month,<sup>24</sup> is far beyond some of the associations' yearly earnings). Naatal Mbay is aware of the risk that this poses to the ongoing functioning of the model and is trying to correct for this. They are planning to pursue several strategies to ensure information continues to be generated at farmer level. One is to reduce the subsidy level. Another is to leverage the resources and capacity of the apex associations to which farmer associations belong. To that end, they have developed an agreement with the Fédération des périmètres autogérés du Sénégal (FPA) and seven other parties to develop a system for farmer production forecasting, which they are now piloting with the potential to expand to all of the FPA's member farmer unions. This system could possibly help to alleviate the resource challenges faced by the farmers associations upon project exit.

## Adaptation

Already SAED is now facilitating the annual process of establishing a price floor, where Naatal Mbay introduced this process. Moreover, recently the fixed price model has now become standard practice in the industry; even the major processors who were not active partners of PCE use the negotiated price. A similar process occurred with insurance: the banks and Locafrique now automatically require that prospective borrowers or lessees obtain insurance. Importantly, banks have started processing loans to finance two plantings with a single application, rather than just one. This enables farmers to avoid delays in undertaking their second planting while waiting for credit, and demonstrates banks' increased confidence in pre-authorizing greater quantities of capital. No independent adaptation by value chain actors has been observed in the provision of extension services and this is a concern for longer term systemic change.

## Further Investments

Firms have not made any of their own investments specifically related to Naatal Mbay's inputs on database management and extension support. However, they are making other commercial investments that support their continued engagement in the contract farming system. These include processors and buyers leasing rice processing units and expanding the credit that they

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<sup>24</sup> The total cost per group is 225,000 CFA (75,000 for a database manager + 50,000 for an extension officer x 3) or approximately \$500.

are offering farmers to support the production of paddy rice. Market actors have assumed the cost of their participation in the annual price setting meeting. Whereas Naatal Mbay originally paid transport costs and per diems to actors to participate, it no longer does so. Moreover, CNCAS has greatly expanded its investment in lending to actors in the rice sector.

### **Replication**

The one instance of replication that was observed was by a financial institution. CNCAS, the semi-public bank, is piloting several aspects of the contract farming model in Senegal's peanut-growing basin, including being repaid in kind for loans, having a third party manage the stocks, and providing processors with stock. However, the three millers or buyers that are project partners have not replicated beyond their traditional business areas, as that area alone can offer sufficient supply.

In terms of replication of the model by *external* actors, some momentum has begun. Naatal Mbay has been working with the Senegalese Ministry of Commerce and the World Bank to set up a Warehouse Receipts System (WRS) in Senegal. Both actors have decided to use the rice trading model as a point of entry for WRS, and are undertaking initial activities. If this continues to fruition, it would enable a fully documented loan receipt system that would be applicable to many other staple crops beyond rice.

### **Other Aspects**

There is a suggestion that the contract farming system has created benefits for other players in the market system, which may increase the pressure for the system to endure. For example, the in-kind repayment system and fixed price have improved service providers' assurance that they will be paid and lowered their transaction costs for serving smallholder farmers. For example, contract harvesters can now be paid in kind for their services at the contracted price and then sell the rice on to millers. Because they already know the price they can sell the rice at, they are more confident in providing the services to smallholders. Moreover, millers' requirements that rice they purchase meet the given standards also influences service providers who are being paid in-kind to provide a quality services.

Other functions did not seem to be fully institutionalized. For example, SAED is supervising the extension officers being paid for by Naatal Mbay that work for the farmers associations. This is a function that presumably should be handled by the associations if this role is to endure without activity financing.

Additionally, a PCE publication noted that “[m]eanwhile, farmer networks that have benefitted from multiple cycles of contracting support and who have learned to study and respond to market trends have become increasingly shrewd and empowered negotiators”. (Contract Farming For Cereal Value Chains Smallholder Market Integration Through Contract Sales Agreements, April 2015, page 8). This observation was not confirmed through the field research, however.

### **SYSTEMIC CHANGE AREA 2: EQUIPMENT LEASING**

The second area in which the research team investigated signs of systemic change was equipment leasing. Relative to contract farming, this intervention was more straightforward, with fewer actors and project activities. This intervention was launched to resolve farmers' challenges of quickly preparing their land for planting, harvesting before quality began deteriorating, and being able to grade their land.

The land preparation service model promoted by Naatal Mbay has the following characteristics:

- An equipment leasing company (Locafrique) imports land mechanization equipment (i.e., tractors, combine harvesters) and graders (for irrigated land expansion and maintenance) and leases or sells it to millers and service providers
- The lease terms are variable depending on the type of equipment
- Purchasers or lessees of the equipment are required to purchase insurance from CNAAS, a publically-subsidized company
- Millers and service providers provide land preparation, combining and/or grading services to farmers and get reimbursed in cash or in kind (with rice)

- USAID’s Development Credit Authority (DCA)<sup>25</sup> provides a guarantee for lessees of Locafrique’s agreement equipment
- Banks such as CNCAS provide loans to farmers, millers and processors to fund their operational costs required to operate the equipment (e.g., fuel, staff)

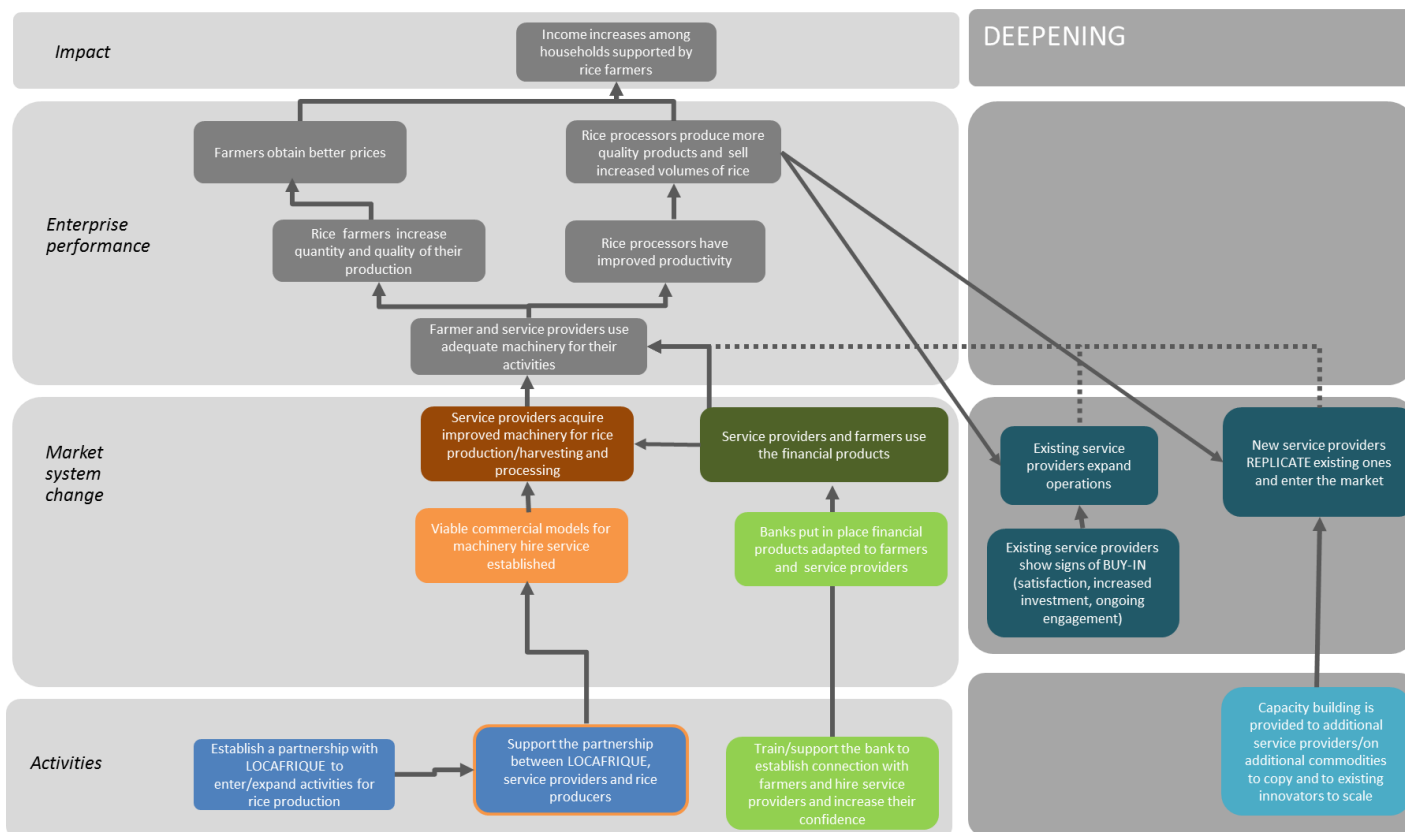
The results chain on the following page presents the impacts and change process anticipated from the land mechanization model. The intervention is based on the belief that better access by farmers to farm machinery services will allow them to greatly improve their operations. Land preparation services will enable them to expand their area cultivated, while combining equipment will allow them to double their crop. For these beneficial effects to happen, a viable equipment rental business model will need to exist, with financing available for service providers to acquire or lease the equipment. As these changes occur, several systemic changes are expected. The actors in the machinery results chain increasingly buy-in to their roles and expand their operations. New equipment lessors and service providers imitate existing ones and enter into the market.

To pursue this, Naatal Mbay has undertaken the following activities:

- Entering into a partnership with Locafrique to expand their leasing activities beyond the traditional areas in which they operated
- Linking Locafrique to potential customers (millers, processors and service providers), and facilitating negotiations
- Attracting an insurance company to offer insurance to lessees
- Facilitating the link between Locafrique and USAID to make greater use of the DCA guarantee
- Supporting the institutional development of millers and processors by providing management training, bookkeeping training, database management, etc. to help professionalize management of their leasing businesses

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<sup>25</sup> A DCA provides a portfolio guarantee to a financial institution. Locafrique benefited from a \$5 million facility to secure its leasing finance.



**Figure 7. Equipment Leasing Results Chain**

## EVIDENCE OF SYSTEMIC CHANGE

### Imitation

The primary example of imitation that has been observed is in the equipment leasing market. BNDE is a newly created bank that has followed Locafrique's lead in financing agricultural equipment to millers. Though it is not offering leasing services itself, BNDE has financed the down payment that one of the millers has put down to lease equipment through Locafrique.

### Buy-In

#### Satisfaction

The significant players in the intervention all expressed their satisfaction with the model. The equipment provider, Locafrique, is satisfied with the system and recognizes that Naatal Mbay played a significant role in its decision to begin offering these services. It is expanding its business in the Senegal River Valley. Similarly, the millers and processors are satisfied with the terms on which they got their processing units. They feel certain that they will be able to repay their loans. CNCAS is satisfied with the system since they are being paid on time by their borrowers.

#### Continued Use

None of the market actors involved in the machinery leasing model have discontinued their participation. Rather, most actors have actually expanded their operations. To be profitable, processors need enough quality rice for their newly acquired rice mills to operate for at least eight months. Farmers are reliant on credit, and so are keen to demonstrate their creditworthiness. Millers all plan to support more farmers in order to pay back the cost of their equipment to Locafrique. This has given the millers a vested interest in making the system work.

#### Adaptation

Locafrique represents the most significant case of potential adaptation of the initial model introduced by Naatal Mbay. Beyond shifting their business model to agricultural equipment leasing with the encouragement of Naatal Mbay – they previously dealt

mainly in motor vehicles – Locafrique has steadily expanded their focus. They have adapted their product offering to leasing larger agricultural equipment like rice millers, and now plan to convert into a bank that will offer working capital financing to actors in the rice sector. Locafrique has also sourced new lines of credit at more favorable rates to be able to reduce the interest rate that it is charging its clients in the SRV.

### **Further Investments**

There has been ongoing investment by all actors involved in equipment leasing, with little direct involvement by Naatal Mbay. Locafrique has continued to invest in its business expansion throughout the partnership with Naatal Mbay, including through the opening of a permanent office in Saint Louis to manage its leasing operations. This has occurred without ongoing subsidy by Naatal Mbay. The processors have leased very large-scale milling units and are expanding their businesses. This expansion has contributed to the professionalization of the processors' operations. Access to equipment services has enabled farmers to make complementary investments in land preparation and, by speeding harvesting with combines, to begin double-cropping.

### **Replication**

Locafrique has expressed an intention to lease equipment to more service providers beyond the SRV, but has not yet done so.

## **CONCLUSIONS**

The key findings and conclusions which emerged from this work include the following:

- Some aspects of buy-in are leading, such as satisfaction with the business model, while others are lagging and can be best assessed following the withdrawal of project support (e.g., continued use).
- Certain aspects of buy-in are difficult to measure when a project is continuing to provide ongoing funding at the time at the research, and are therefore better assessed following the withdrawal of direct financial support. This pertained particularly to the extension officers and database managers that are funded under the contract farming intervention, especially given that the level of financial support – 90% – has not been lowered over time to indicate if this has promoted shifts in project partners' decisions.
- A range of external factors played an instrumental role in supporting the dynamism of the rice sector in Senegal after a long period of stagnation. Among these is the more active role that the government is now playing in influencing the actions of market players. The government has applied pressure on rice importers to reduce imports during the local production season and instead increase domestic purchases. This has been instrumental to the involvement of the rice importers in the process, who might have otherwise undermined the model by undercutting local prices with cheaper imports. Another factor is growing demand for aromatic varieties in the Senegalese market, which supports growing investment by market actors.
- The ongoing role of subsidies in some elements may constrain the ability of the project to foster systemic change in some areas. Ideally subsidy would be reduced, weaning the subsidized provider and allowing for other actors to enter. No one can enter competing with the subsidy, unless the actual market is much larger than the subsidy can reach.
- There are a range of structural factors and risks that may limit the ongoing growth of the project-supported models, as noted by Richard Kohl (2016). These include:
  1. SAED is still not able to provide ongoing extension support nor incentivize farmers to maintain secondary and tertiary systems
  2. Unclear how much more land can be made available and where
  3. As machinery, liquidity, seeds are increasingly available, may be approaching limits of yields
  4. Access to capital is a significant issue – a very small percentage of formal credit in Senegal is invested in agriculture
  5. Continued weather and pest problems threaten double planting
  6. Lack of guarantees, servicing and maintenance for machinery
  7. Impossible for GOS to get anywhere close to self-sufficiency, while costs of intervention will increase dramatically as limits are approached
- Like many projects, Naatal Mbay uses a mix of interventions that featured a strong facilitation approach, but also undertakes interventions in which they provide high direct subsidies. This includes their work in the seed sector, in which new infrastructure for the government seed agency was financed, and their almost full financing of extension

and database management staff to support contract farming. Examining only the interventions in which a strong facilitation approach was used, without considering the influence of the direct subsidies (and indeed, whether the facilitation interventions can survive absent the direct subsidies) would provide an incomplete picture.

- Naatal Mbay learned with time that building redundancy into the system was an important characteristic supporting systemic change. So instead of only training the rice mills on quality standards, they also built the capacity of farmers and the banks. This helps to equalize the power in the relationship at selling time, relative to enabling only one actor to be the arbiter of quality. The same lesson applied to the management of information on production levels. Naatal Mbay found that the millers, bank and farmer associations all needed to manage information on production estimates and volumes harvested and reimbursement levels. This builds the capacity of all actors to negotiate effectively and have the information needed to make their own analysis and decisions.

## B. ZAMBIA: SYSTEMIC CHANGE CASE STUDY ON PROFIT+

### SUMMARY

The FTF/Zambia Production, Finance, and Improved Technology Plus (PROFIT+) project is a market development initiative that targets a range of value chains including maize, soybean, groundnut, and sunflower. This case study highlights how PROFIT+ is introducing changes in the structure of the localized rural input supply system through new actors (community agro-dealers) and aggregation models (CAD-owned ‘producer companies’). While in the early stages - and compounded by the context of two years of heavy drought, which has led to shifts in behaviors from those that are revenue maximizing to those that are risk mitigating and resilience maximizing – these structural changes in the system are beginning to improve smallholder access to input and extension services.

**About the project:** The objective of PROFIT+ is to increase productivity, expand trade, and increase investments in Zambia, by strengthening market systems in rural areas to facilitate stronger linkages to private sector service providers through public private partnerships (PPP). The project runs from 2012-2017 and is geographically focused in Eastern Province and peri-urban Lusaka. The project began during a period of strong economic growth, but for the last two years Zambia has suffered from a serious drought.



PROFIT+ Community Agrodealers

**Key findings** include:

- The producer company model shows strong potential to become an enduring change in the structure of the rural input supply system, localizing services and increasing access to extension and inputs for large numbers of smallholders; 18 PCs have formed thus far, encompassing 161 CADs which on average serve between 100-400 farmers directly at present<sup>26</sup>. While the majority are those directly supported by the project in business development and linkages to a bank for credit financing, there is evidence that the model is beginning to spread independently, with Cargill and Syngenta each in the process of creating hundreds of CADs. In addition, there are already several additional groups of CADs signaling a desire to create imitation PCs. The model is still too recent to evaluate conclusively; it should be revisited in two or three years to re-evaluate the ways in which this change in actors and structures for input supply led to sustained and scaled development outcomes.
- With regards to satisfaction, one indication of buy-in, farmers interviewed reported a net positive impact of the producer company on their lives. Technologies, in particular conservation tillage practices, have resulted in time saved from no longer having to travel to town to purchase inputs; increased yields; and improved food security. Since the research sample was not representative of the full beneficiary population, further research would be needed to determine how widespread these impacts are as additional PCs begin and expand operations in the region.
- As the systemic change Theory of Change introduced in Section II suggests, climactic shocks will reduce the rate of adoption of innovations. An interesting phenomenon in the Zambia case is that while broad adoption and replication of innovations has slowed, the ties formed among actors participating in the program have contributed to increased resilience.

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<sup>26</sup> In this context, ‘serve’ refers to farmers which CADs reach as customers. Each CAD’s commercial reach is driven by their location, their own nascent resources and capacity, farmers’ financial capacity and adoption rates, and crops grown. Those in areas where villages are densely populated in close proximity to CADs, are able to serve 400+ farmers. Where distances between villages are bigger, the outreach is smaller. As the CADs grow and progressively expand into crop trading, their outreach becomes wider as farmers are more willing to travel to sell their crop. The CADs that have been creating and strengthening agribusiness groups in the communities for some time (lead farmer training groups from the earlier project phase, credit saving and trading groups, etc.) also seem to have larger outreach. Another element is years spent in business – CADs that have been working with PROFIT+ for three years have a much wider outreach than those that were brought on board in Year 4 of the project. This explains the range in farmers engaged per CAD.



During periods of shocks, risk mitigation may be as, or more important, than increased income. One practice widely adopted within the past few years is ripping associated with conservation tillage. Ripping is one of the few technologies promoted to farmers that does not require increased cash costs and risk exposure for farmers yet through its associated protection of soil moisture, can mitigate yield loss during times of drought.

- Given smallholder vulnerability to shocks, promoting changes in practice that improve resiliency of current yields, even without significant potential for yield increases, in the face of increased climatic shock will become increasingly important to focus on and promote in the future. Climatic shocks will increase and smallholders will have to find a balance between resilience maximizing and profit maximizing strategies.

## CONTEXT

PROFIT+ began in 2012, during a period of strong economic growth, both for the economy at large and the agricultural sector. GDP growth has averaged 6.45% over the past ten years, with ag and the agricultural subsector growing 7% in that same period.<sup>27</sup> Relative to other countries in the region, smallholders in Zambia are more heavily commercialized. In 2015, 60% of Zambian farmers were using hybrid maize seed, compared with 7% in Mozambique.<sup>28</sup> The agricultural private sector, both agro-input suppliers and commodity traders, were established and competitive. End-market demand for maize is large and growing, as the total population of net maize consumers is growing faster than net maize producers. From 2000-2010 Zambia's urban population grew at 4.2% per year, while the rural population grew at only 1.5% per year. Since 2000, Zambia's urban population grew from 3.4 million to 5.2 million people, all of whom are net consumers of maize.<sup>29</sup> There was growing appetite on the part of input suppliers to reach smallholder customers in Eastern Province, but limited resources to reach such highly dispersed and opaque customer bases.

In this context, PROFIT+ engaged with an agricultural sector relatively more advanced than in neighboring countries. PROFIT+ was faced with a smallholder beneficiary population already aware of improved inputs, but with limited access, and a private sector eager to increase supply to these communities but with limited knowledge of where sufficient pockets of demand existed, or reliable local intermediaries to aggregate demand to a level that was profitable to supply. Thus the project's objective was to facilitate the emergence of a new value chain actor that could function as a bridge between existing (but dispersed) smallholder input demand, and companies eager to meet that demand.

PROFIT+ has developed a two-tiered village-based firm model to sustainably increase smallholder access to inputs and extension on good agricultural practice. The model is an adaptation of a microenterprise/village-based agent model, bringing together 3-12 microenterprises to form an umbrella Producer Company (PC) firm to coordinate input supply orders and food commodity sales to traders, millers, and processors. While a version of the community agro-dealer (CAD) model was introduced under the previous PROFIT project in Southern Province, the CAD model was new to Eastern Province, and the PC model new to the whole country when introduced in late 2015 by PROFIT+.

Compounding the project's challenge has been a series of drought years in the rainfed production areas across Zambia, including Eastern Province. The 2014/15 maize season saw a significant drop in rainfall, negatively affecting yields, which dropped from a 2013/14 average of 2.36 tons/ha to 1.75 tons/ha in 2014/15.<sup>30</sup> While final yield figures for 2016 are not yet available, anecdotal evidence shows that rains came late and ended early, likely resulting in another depressed production season.

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<sup>27</sup> Indaba Agricultural Policy Research Institute, Facts about Zambian Agriculture, Presentation at the Provincial Outreach Workshop, Luapula, Dec 5, 2014. [http://fsg.afre.msu.edu/zambia/Facts\\_about\\_Zambia.pdf](http://fsg.afre.msu.edu/zambia/Facts_about_Zambia.pdf)

<sup>28</sup> Uaiene, Rafael. "Determinants of Agricultural Technology Adoption in Mozambique," International Food Policy Research Institute. [http://www.tropicalsoybean.com/sites/default/files/Determinants%20of%20Agricultural%20Technology%20Adoption%20in%20Mozambique\\_Uaiene.pdf](http://www.tropicalsoybean.com/sites/default/files/Determinants%20of%20Agricultural%20Technology%20Adoption%20in%20Mozambique_Uaiene.pdf) Accessed 7/20/16

Kohl, Richard. "Scaling Up of Drought Tolerant Maize in Zambia," February 8, 2016. <https://agrilinks.org/sites/default/files/resource/files/BFS%20Scaling%20Review%20-%20Zambia%20Report%20REVISED%202-8-16.pdf> Accessed 7/20/16

<sup>29</sup> Central Statistics Office, Zambia. Accessed 8/16/16. <http://www.zamstats.gov.zm/census/cen.html>

<sup>30</sup> Zambian National Farmers Union Statistics.

Within this combined context of long-run smallholder growth, confronted by short-run climatic volatility, this research focused on three questions:

- a. To what extent has the producer company (PC) model developed and implemented under PROFIT+ become a systemic change of the input and output marketing system?
- b. What effect has the expansion of CADs as input and extension retailers, and commodity offtakers, had on smallholder adoption of improved technology and practices?
- c. What effect has the increased incidence of drought had on smallholder adoption of improved practices?

The PROFIT+ project strategy is outlined below, including its farmer and firm-level theories of change; this is followed by an assessment of the extent to which the PC model has led to systemic change, as well as its prospects for doing so in the future. Finally, this case study reviews the farmer-level effects of producer company transactions and relations, and what this reveals about the extent to which these affect farmer adoption of improved production practices in a context of recent droughts.

## PROJECT STRATEGY

The PROFIT+ project's approach to input supply expansion rested on four premises, constituting an inverted farmer adoption theory of change:

- a. Smallholder farmers (SHs) currently under-utilize improved inputs and production practices, including high quality seed, fertilizer and agrochemicals, as well as appropriate tillage, crop management, harvest and post-harvest practices.
- b. SH underutilization is driven by lack of knowledge and lack of access, which limits stimuli to trigger change and improvement.
- c. This lack of access is driven by three factors:
  - i. Infrastructure-driven costs for input suppliers and retailers to serve SH communities.
  - ii. Opaque and fractured demand, compounded by limited bridges into SH social networks and low transactional volumes, requiring commensurately more sales and marketing costs per unit sold.
  - iii. Low managerial and financial capacity within SH social networks, which means higher turnover in rural retail enterprises and limited growth capacity.

Thus, PROFIT+ investigated constraints to smallholder access to high quality inputs and extension services. Large scale input suppliers were generally interested in smallholder customers, but transaction costs proved too high without a local retail point that could serve to actively market and drive sales, aggregating smallholder demand to sufficient tonnages to justify distribution to the village level. However, it was difficult for these companies to identify individuals at the village level who were sufficiently trustworthy, as well as agronomically and financially capable, to fulfill this aggregation and sales role.

PROFIT+ deployed a four phase strategy to trigger a sustainable expansion of input supply farther into rural catchments:

- a. *Training*: Building on the network of lead farmers developed in the first two seasons of the project, PROFIT+ identified those lead farmers with the greatest potential capacity, approximately half of their total network of nearly 700 lead farmers, and invited them to enroll in a training program to become 'community agrodealers' (CADs) in which they would begin to function as a bridge between input companies willing to invest in this new structure and smallholder groups. This network of CADs received training in core business skills development, including inventory management, marketing and sales, regulatory certification, and financial literacy. In addition, all CADs have ongoing relationships with the government extension officers in their areas, and were originally trained by them in agronomic best practices in the first two seasons of the project, when the CADs were still just demonstration site hosts.
- b. *Structuring partnerships with input suppliers*: The project's assessment of costs to serve these CADs showed that, without some form of risk buy-down, it would be cost prohibitive for input suppliers to manage large networks of CADs individually. PROFIT+ then developed partnerships with several input suppliers to take on management of these CAD networks in two ways, one a lighter touch, the other more intense. Some suppliers engaged the CADs as full franchises, branding and rehabilitating their storefronts, providing them with stock on consignment, and facilitating wholesale pricing from other input suppliers. Other suppliers simply provided an initial consignment stock, with the initial consignment partially subsidized by PROFIT+ to reduce risk.

- c. *Encouraging emergence of CAD-owned firms (“Producer Companies”)*: In their second season, these CADs were presented with a potential, voluntary model that they were encouraged to follow: form clusters with other CADs, and establish a new wholesale intermediary firm, with each CAD as a shareholder. This model is intentionally not an association, but a separate corporate entity, with each CAD holding an equity stake. These clustered firms, which the project called producer companies (PCs) would reduce input supplier costs to serve, and allow CADs to share management challenges and leverage their size for economies of scale in input purchasing and output aggregation and trade. In the process of organizing themselves into production companies, CADs continued to function as network bridge for larger input suppliers but were also able to accelerate the dissemination of information as well as integrate vertically providing input, extension and output marketing services.
- d. *Support business development of PCs*: These PCs were then supported in developing business plans around models of their own choosing. Most PCs are operating as wholesale intermediaries between input suppliers and their constituent CADs. All of them are acting as commodity buyers, some for in-house processing into value added products, and others as traders, selling on through the national agricultural commodity exchange (ZAMACE) or directly to larger buyers such as Cargill.

Thus PCs are supposed to provide a conduit for innovation (improved inputs and practices) into the village level SH networks. They are meant to overcome the constraints to access through pooling managerial and financial capacity, as well as their individual customer catchments to achieve economies of scale in purchasing inputs and supplying offtakers.

The producer companies interviewed engaged in a range of activities, including::

- a. *Wholesale input procurement*: Some PCs are comprised of constituent CAD businesses, all currently engaged in agro-input retailing. The PCs are operating as an umbrella intermediary between the CADs and their input suppliers, generating wholesale price discounts, and providing ‘one stop’ delivery points for input suppliers for all constituent CADs.
- b. *Embedded extension and in-field services*: Some PCs are working through CADs to recruit and provide teams to spray, weed, prepare land, and perform other relevant in-season services.
- c. *Output procurement, warehousing, and trading*: Many of the PCs are engaging in output trading, utilizing the CAD empty input warehouses as aggregation points at the end of the maize season. These PCs are selling on through ZAMACE (the commodity exchange), through border arbitrage (at the Malawi and DRC borders), and holding for price speculation later in the year.
- d. *Formal and informal outgrower schemes*: Several PCs have initiated small outgrower schemes for groundnut, soy, and maize, providing input on credit to be repaid with a percentage of the crop yield.
- e. *Value added processing*: Several PCs are exploring value addition processing (tomatoes), high nutrient protein supplements (soy and groundnut paste with micronutrient additives), and cooking oil production.

## EVIDENCE OF SYSTEMIC CHANGE

While the project’s implementation approach evolved over time, the producer company model was the first phase that was anticipated to be fully self-sustaining by the end of the project. In this research, two aspects of the model were evaluated: first, the extent to which the PC model shows evidence of systemic change in the input supply system, evaluated through the current and potential extent of firm buy-in and peer imitation; and second, the extent to which those changes are triggering SH adoption of improved inputs and practices, and why (or why not).

### Imitation

As all producer companies are just at the end of their first operating season, there has been limited time for imitation to occur. That said, there was mixed evidence of the potential for the PC model to be imitated by other potential rural entrepreneur groups. The three PCs interviewed reported that there are at least three additional PCs, comprised of other CADs from PROFIT+’s network, voluntarily forming without PROFIT+ financial or managerial support. While this at minimum proves that other CADs perceive the PC model as worthy of imitation, it does not provide evidence that the innovation would necessarily expand beyond the social network of CADs created by PROFIT+.

This prospect for horizontal spread from current PC CADs to comparable nascent entrepreneurs in the same or neighboring villages is limited in part by the nature of the model itself: competitive networks of peer firms tend to avoid sharing business innovations as ‘trade secrets’, and the core functions of the model’s success occur in relatively remote areas in short transactions between farmers and the firms. In other words, while many input and commodity traders are socially connected within districts and towns, these traders rarely have opportunities to observe each other’s behaviors (company structure, strategy, buying practices, etc.) in the field, but instead depend on farmers and word of mouth to piece together their competitive landscape.<sup>31</sup> The core changes at the firm level the project seeks are fundamentally about internal company dynamics (shareholding structure around equity stakes) that build on pre-existing businesses with relevant sector-related experience.

The greatest potential for imitation may be through external encouragement by input supplier firms. The input supplier network of firms that PROFIT+ has worked with and linked to CADs has voiced unanimous interest in assisting PCs to succeed, because they provide a single stop for supply to an exponentially larger network of end-market customers than a single CAD. While PROFIT+ is only this season (late 2016) engaging in comparable work with offtakers, the underlying market logic is the same, with its success is driven by the ability to reach large volumes of commodity through a single transaction point (the PC). If the current cadre of PCs proves profitable for input suppliers and offtakers, it will be interesting to see the extent to which they attempt to support CAD and PC formation with other potential entrepreneurs.

### Buy-In

Evidence of buy-in is explored through the three categories introduced in Section II: satisfaction, continued use, and adaptation.

#### Satisfaction

All three PCs reported high levels of enthusiasm, though only one PC had completed a full business cycle (the other two were still in the middle of their buying season). The one PC interviewed with the completed outgrower scheme season reported a repayment rate of 100%. After discussing the nature of the model and speaking with outgrower farmer participants, it seems likely that this high repayment rate was driven by three factors:

- *Proximity*: The PC was able to leverage their geographic dispersion as individual CADs to recruit farmers within no more than 2 kilometers of an individual CAD. This proximity facilitated repeated visits, fostering social cohesion and enabling CAD’s to ‘check in’ more often to see if other buyers were approaching outgrower participants to sidesell.
- *Pre-existing social capital*: The majority of outgrower scheme participants had been members of the CADs’ training farmer groups previously, and/or knew the CAD socially in some other way. This cohesion was reported by all outgrower scheme participants as a core reason they were uninterested in transacting with anyone else.
- *Repayment only required to cover input costs*: The PCs required repayment only in the amounts of the pre-financed inputs, and offered market price for the remaining product. This allows the farmer to determine whether they will hold back the remainder of the crop for home consumption, choose another market, or some mix of the two. The outgrower scheme participants interviewed reported that they are holding back some portion of their crop for home consumption, but any surplus they sold or will sell to the PC.

These three factors and their initial success hold promise for other PCs beginning to engage in outgrower schemes this coming season. The core reasons for the scheme’s success should accrue similar advantages to other PCs engaging in trading: social cohesion, geographic proximity, and farmer freedom to choose the market for some significant percentage of the crop.

#### Continued Use

Since the companies are only finishing their first year of operation, we were unable to empirically assess any continuation. That said, all three companies stated that they are planning to continue or expand their operations moving forward. The one company that had successfully completed an outgrower scheme round recouped their initial investment and earned profit, which they are reinvesting in further operations. The interview with the one producer company furthest along with its operations did

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<sup>31</sup> Producer Company #1 Interview Notes.

confirm, however, that the CADs felt they were better able to share duties within the PC, playing to each other's strengths, and were able to leverage better consignment and unit cost terms with suppliers because they were ordering higher volumes. This seems to validate that the PC model can solve for managerial and financial capacity problems faced by autonomous CADs.

### **Adaptation**

The producer company model, within the cadre of existing CADs, shows high prospects for voluntary adaptability. The CAD training course, PROFIT+ implemented, focused on building fundamental skills in business analysis as well as business operations, enabling CADs to evaluate potential business ventures independently. Out of this training, CADs interested in forming into PCs have taken the model in a wide range of directions. One PC interviewed is focusing on producing high nutrient protein supplements for child nutrition and selling to the government program. One PC is focusing on the outgrower model for maize and groundnuts, mentioned above. The third PC is focused on developing a tomato supply chain for processing and maize trading.

This adaptability is a critical factor for success moving forward in an uncertain macro- and micro-economic context. As farmers shift commodities and production practices in response to climatic variability and market shocks, PCs will need the capacity to anticipate and drive shifts in their own goods, services, and procurements from farmers. Additionally, PROFIT+ is starting to see agro-dealers that used to be in town reach out into the communities, because there are viable business partners now in CADs.

### **Replication**

There is evidence of the CAD model particularly replicating, as its proof of concept is demonstrated. Cargill, for example, is creating 360 CADs, and Syngenta is adding 100, using P+s CAD training program and adapting it internally.

### **Effects on Smallholder Adoption of Improved Technologies and Practices**

In conducting the case study, 15 interviews were held with farmers in the CADs' village social networks. The interviews were semi-structured around a common set of questions, and assessed the extent to which the PCs functioned as a social bridge into their network to spur innovation and adoption of improved inputs and practices. One challenge faced in this part of the research was the fact that CADs were the primary point of interaction farmers had with PCs, thus it was impossible to separate the CAD function from the PC in spurring innovation. That said, for PROFIT+, there does not have to be a functional difference between the two: the PC is critical for the duration and success of its constituent CADs, and constituent CADs in turn drive farmer-level innovation. A second challenge was the presence of other donor programs providing additional 'bridges' for innovation adoption. Consistently, farmers listed CADs as their primary source for extension advice and the inputs that the CADs stocked; however in addition, interviewed farmers indicated other organizations and programs as sources of extension information.

Results from adoption are highlighted below:

*Conservation Tillage Adoption:* Over 90% of interviewed farmers reported adopting conservation tillage, including deep-line ripping and planting basins, from their CADs. Additionally, over 80% of interviewed farmers reported that their neighbors were adopting or had adopted one or both of these practices from them, based on conversational interactions with neighbors and seeing these practices replicated in neighbors' fields<sup>32</sup>. Farmer reasons for adopting conservation tillage demonstrated very comprehensive understanding of changing rainfall patterns and the need to adapt production practices as a result. One farmer stated that she is using conservation tillage because "the climate is changing, rains are not coming like they used to...ripping and basins have improved yields." Another stated that "[the] weather pattern is unpredictable now, so [I] adopted this new set of technologies because they conserve moisture."

*Seed Access:* Nearly half of interviewed farmers stated that CAD proximity has increased their access to improved seeds locally, instead of having to travel to town to procure. Of the remaining farmers who did not list seed access increase as a result of

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<sup>32</sup> It should be noted that other more empirically robust studies denote much lower CA adoption rates across Zambia.

CADs, these farmers were growing recycled seed mostly because they claimed not to have sufficient money to purchase improved seed, not because they were unaware of its benefits.

*Crop Diversification:* PROFIT+ has seen in its project areas a significant shift to diversification – this has been influenced in part by climate change, which reduced maize yields, and in part by the role that CADs and PCs have played in actively opening up market opportunities for other crops such as soy, tomatoes, sunflowers, groundnuts, and onions. As one of the outgrower scheme participants noted that she participated in the scheme for soy and groundnuts to “diversify [her] crops: I realize that the weather pattern has changed, so I should grow more than just maize.”

*Reach to poorer farmers:* Whereas most larger outgrower schemes with less local knowledge will tend to engage only farmers with larger asset bases and a track record of commercial engagement, CADs were able to leverage their knowledge of local farmer practices to select the best farmers, regardless of asset base, for participation in the scheme. This local knowledge enabled the schemes to reach relatively poorer farmers because of their relationship and reputations as good growers.

### **Drought Effect on Adoption**

In particular, the droughts during the 2014/15 and 2015/16 maize seasons provide a snapshot of the risk management strategies of target smallholders, and how these strategies spur or depress adoption of different practices. The droughts were cited (in the form of ‘erratic rainfall’ in recent seasons, or some version thereof) by many farmers as the reason they adopted minimum tillage, a practice explicitly focused on soil moisture retention. At the same time, this same increase in climatic volatility increased the perceived (and actual) risk of purchasing commercial inputs like seed and fertilizer, depressing demand. This depressed demand was a function of two inter-related factors: a lack of funds, which most farmers cited, needed to purchase the improved inputs at planting because of lower yields from years before, and an increased wariness of investing more cash, and thus increasing risk exposure, into agricultural activities. This suggests two things:

- First, that adoption of cash intensive technologies is highly sensitive to changes in farmer perception of environmental stability. In scenarios where smallholders perceive high volatility (e.g. increased risk of drought in future seasons), even farmers with a firm grasp of the benefits of improved inputs will not adopt them because of increased risks.
- Second, the CADs were still successful in promoting resiliency-enhancing behaviors, specifically conservation tillage, because this was a cash-neutral risk management technique for smallholders facing increased frequency of drought.

## **CONCLUSIONS**

1. The producer company models show strong potential to become an enduring change in the rural input supply system. The nature of the model demonstrates high potential for duration and diffusion (see #2 below), and there are already several additional groups of CADs signaling a desire to create imitation PCs. While the model is still too recent to evaluate conclusively, it should be revisited in two or three years to re-evaluate.
2. Farmers interviewed reported a net positive impact of the producer company on their lives. Technologies, in particular conservation tillage practices, have resulted in time saved from no longer having to travel to town to purchase inputs; increased yields, and improved food security. Since the research sample was not representative of the full beneficiary population, further research would be needed to determine how widespread these impacts are as additional PCs begin and expand operations in the region.
3. The model’s flexibility to adapt is key to increase prospects for sustainability and imitation. A key theme that emerged from the producer company interviews is that the capacity to adapt the company model to virtually any product or service line increased their interest and increased the perception that the venture was less risky. The model can be adapted moving forward if market conditions shifted and they needed to diversify or drop certain products or services. Additionally, this flexibility should increase the potential for imitation, as other current or potential firms evaluate the model’s relevance for other product and service lines, even outside of agriculture. Future projects seeking to drive imitation should develop models that are not tied to a limited number of value chain-specific products, but instead include mechanisms to encourage firm leadership to continuously evaluate the market for new opportunities, or to pivot away from existing opportunities when market dynamics move against them. This skillset and firm capacity,

more than a specific product line (such as seed or fertilizer), seems to have the greatest potential to sustainably transform the local retail sector to better supply smallholders' needs.

4. Horizontal diversification is a core part of success. The interviews with farmers and PC CADs painted a picture of the local market system in which retail demand amongst farmers for any given product was always tenuous, but that, across all potential goods and services, there was a consistent gap between supply and demand. In this context, firms need to diversify product offerings as much as possible to capture as much of this demand as possible, smooth revenue across calendar months, and develop a healthy balance between high volume/low margin products (such as seed) and low volume/high margin products (such as vaccines and chemicals). Additionally, as PCs diversify the product lines of their retail CAD shops, the village-based customers increasingly benefit in two ways: first, through time savings from 'one stop' shopping, and second, as PCs take on more value addition services (such as milling and processing), they are reducing 'distance tax' that farmers pay for those value-added goods locally. For example, approximately 22% of maize growers are net maize consumers in Zambia<sup>33</sup>, buying more in refined maize meal than they sell at the end of their season. The farther from the consumer that this milling occurs, the greater the transportation and intermediary costs, which are often passed on to the consumer. If the PC model proves able to localize these value addition services, even net buyers of maize meal will pay less, as their maize is not traveling as far or passing through as many hands before it is processed and sold back to them. These kinds of local economy 'multipliers' are still theoretical, but could have pro-cyclical effects, generating ever growing and diversified local firms and employment.
5. Risk mitigation is as important or more than income increase for farmers. One consistent finding across the farmer interviews was their desire to prioritize risk mitigation over potential yield increases. Most farmers interviewed demonstrated sophisticated understanding of the potential for increased frequency of extreme weather, including drought and floods, raising the risk potential of increased investments in agricultural inputs. It seemed (though no respondent explicitly stated), that one reason ripping and basin making were consistently and widely adopted within the past few years is that it is one of the few technologies promoted to farmers that does not require increased cash costs and risk exposure for farmers. In this context, it is increasingly important for projects to evaluate potential practices and technologies for promotion not only for their potential to raise incomes and yields in optimal climatic conditions, but also for their effect on the farm and households' risk exposure. Promoting changes in practice that improve resiliency of current yields, even without significant potential for yield increases, in the face of increased climatic shock will become increasingly important to focus on and promote in the future.

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<sup>33</sup> Indaba Agricultural Policy Research Institute, Facts about Zambian Agriculture, Presentation at the Provincial Outreach Workshop, Luapula, Dec 5, 2014. [http://fsg.afre.msu.edu/zambia/Facts\\_about\\_Zambia.pdf](http://fsg.afre.msu.edu/zambia/Facts_about_Zambia.pdf)

## C. RWANDA: SYSTEMIC CHANGE CASE STUDY ON RDCP II

### SUMMARY

The Feed the Future Rwanda Dairy Competitiveness Program II (RDCP II) is working to strengthen Rwanda's entire dairy value chain. The program is also playing a leading role in improving Rwanda's food safety standards for dairy, while raising consumer awareness about the importance of drinking quality milk. This case study highlights an early stage example of systemic change in the dairy industry, as RDCP II's efforts to introduce milk quality grades and standards into the industry, along with new aggregation and output models, is starting to alter the norms and practices of key actors (processors, outlet stores), building incentives for these behaviors up and down the supply chain.

**About the project.** RDCP II is a \$15 million, 5-year activity implemented by Land O'Lakes International Development and its partner African Breeder Services/Total Cattle Management (ABS/TCM). The project is designed to reduce poverty through expanded marketing of quality milk, and is a successor project to RDCP I. RDCP I worked in three districts in Eastern Rwanda and the capital city of Kigali. RDCP II primarily worked at the farm level to improve milk quality among PEPFAR-supported farmers, but also engaged to a limited extent with the dairy board on their operations. In contrast, RDCP II covers 17 districts across all of Rwanda's provinces. It has a greatly expanded focus on productivity, milk quality, consumption, policy change, facilitating private investments, accessing financial services and accessing business development services. Whereas RDCP I took a more direct delivery approach, RDCP II was more market-oriented and facilitation-based. This case study focuses on RDCP II, in particular its work to change industry norms, through informal and formal rules, around milk quality.



*Outside of milk processor Blessed Dairies, a key RDCP stakeholder*

**Key findings** include:

- There is strong evidence that both an underlying business model facilitated by the project (leveraging milk collection centers for aggregation and 'milk zone' franchised businesses as output centers for quality milk sales), as well as industry-level adherence to defined quality standards, are becoming institutionalized, independent of RDCP II, amongst influential firms that control major portions of the dairy market.
- Consumers recognize and reward higher quality milk, and while this is currently limited to Kigali-based sales, the benefits of quality improvements flow across the system, including through to many rural businesses (e.g. farms, milk collection centers, etc).
- Imitation by non-project partners is beginning to take place. This is an excellent signal that quality standards are playing a role in influencing market actor behavior, and that key value chain actors (processors in this case) are becoming de-facto enforcers of the standards rather than relying solely on the government agency to do that vetting for them.
- Quality standards are being adopted by new entrants.
- In terms of replication, RDCP II's pilot with lead processor Inyange started with just a single milk zone<sup>34</sup>, but the company has since replicated the model with dozens of milk zones independent of project support. After its initial imitation, Crystal Fresh, another lead processor, is replicating the milk zone model, expanding its milk retail outlets.

### CONTEXT

Rwanda is a landlocked country in the Great Lakes region of central Africa covering roughly 26,000 square kilometers of land and 1,400 square kilometers of water. Rwanda's population is estimated at 11.8 million people (of which 52% are women) in

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<sup>34</sup> A milk zone is a single retail kiosk dispensing pasteurized milk.



2016.<sup>35</sup> The current population growth rate is estimated at 3.5 percent per year<sup>36</sup> while the population density is the highest in Africa, at 407 people per square kilometer,<sup>37</sup> and more than 500 people per square kilometer of arable land.

Despite its small geographic footprint, more than 90% of the population depends on agriculture for their livelihood, and the agricultural sector contributes 34% of the national GDP.<sup>38</sup> Strong economic growth over the past decade has been accompanied by substantial improvements in living standards, evidenced by a two-thirds drop in child mortality and the realization of near-universal primary school enrolment – Rwanda had met most of its MDGs by the end of 2015.<sup>39</sup> Rwanda's long-term development strategy is to transform from a low-income agriculture-based economy to a knowledge-based, service-oriented middle-income economy by 2020. Today, 39% of the population lives below the poverty line<sup>40</sup>.

The Rwanda dairy industry offers a potential pathway out of poverty for the large numbers of households keeping livestock and providing services and value addition throughout the supply chain. The current "farm gate" value of milk is approximately Rwf 79.7 billion (US\$1.3 billion). The dairy industry contributes 15% to agricultural gross domestic product and 6% to GDP<sup>41</sup>.

However, the industry is not living up to its potential. Rwanda's dairy consumption and production levels are both low relative to world and regional averages. Milk consumption in Rwanda is 40-59 liters per person per year<sup>42</sup>, compared with 111 liters per person per year in Kenya.<sup>43</sup> Rwanda produces around 706,000 metric tons of milk annually (2015 data, estimates)<sup>44</sup>, which translates into an average daily yield per cow of just 3.2 liters, far below potential yields and those in more competitive countries on the continent, such as South Africa.<sup>45</sup> This low average yield is driven by several factors, including that pure breeds constitute just 6% of the 1.3 million dairy cattle in the country.<sup>46</sup> Moreover, the quality of raw milk has traditionally been very low, and there has been limited processing capacity.

However, there are signs that the industry is evolving in a positive direction. Rwanda's dairy industry has increased milk production, processing and trade in the last few years. Production of milk has continuously increased through the national one-cow-per-family flagship program which was introduced in 2006 and has since seen over 200,000 cows distributed to vulnerable families. In 2013, with the support of the RDCP II, Rwanda developed the national dairy strategy that seeks to increase milk production, processing and marketing. Nevertheless, challenges remain including domestic production of processed and unprocessed milk.

## PROJECT STRATEGY

This section presents RDCP II's strategy for fostering systemic change with respect to the widespread adoption and enforcement of quality standards in the dairy sector, and findings about what indications of systemic changes were uncovered. Quality standards that are understood, applied and enforced are a powerful force for supporting positive behavior in any market system. The challenge is to align the behavior of the many stakeholders that collectively maintain or prevent effective standards, including enforcement behavior by government agencies, investment in necessary equipment, adherence to rules by the private sector, and obtaining the knowledge and adherence to rules by farmers so they can meet the standards.

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<sup>35</sup> [www.worldometers.info/world-population/rwanda-population/](http://www.worldometers.info/world-population/rwanda-population/)

<sup>36</sup> [http://web.undp.org/evaluation/documents/ADR/ADR\\_Reports/Rwanda/ch2-ADR\\_Rwanda.pdf](http://web.undp.org/evaluation/documents/ADR/ADR_Reports/Rwanda/ch2-ADR_Rwanda.pdf)

<sup>37</sup> <http://www.institutions-africa.org/filestream/20130725-presentation-rwanda-agricultural-sector-and-its-impact-on-food-security-and-economy>

<sup>38</sup> <http://www.minagri.gov.rw/index.php?id=578>

<sup>39</sup> <http://www.mdgmonitor.org/mdg-progress-rwanda-africa/>

<sup>40</sup> [www.statistics.gov.rw](http://www.statistics.gov.rw)

<sup>41</sup> National Dairy Strategy, Ministry of Agriculture, Government of Rwanda. 2013.

<sup>42</sup> NISR, 2015, and EADD, 2012.

<sup>43</sup> Kenya 2009.

<sup>44</sup> <https://cgspace.cgiar.org/bitstream/handle/10568/2410/Dairy%20Value%20Chain%20Rwanda%20Report.pdf;sequence=1>

<sup>45</sup> TechnoServe. The Dairy Value Chain in Rwanda. 2008.

<sup>46</sup> Rwanda National Dairy Strategy. As of 2014/15, 40% are local breeds, 54% are crossbreeds and 6% are pure breeds.

In order for changes in the wider dairy industry (such as improved quality standards) to have an impact on small scale farmers, there needs to be effective and scalable models for connecting farmers to end markets. RDCP II's focus has been on developing model contracts between the different key actors: farmers, cooperatives, transporters, milk collection centers (MCCs), and processors. The two early adopters of these contracts are the Inyange Industries and Blessed Dairies milk processors, who signed contracts with cooperatives of milk producers to boost their volumes of production.

Another business model that RDCP II has introduced sees milk producer cooperatives sign contracts the Milks Sellers' Association (an associations of transporters) to transport milk from farms to MCCs, often using bicycles. This overcomes farmers' previous challenge with getting their milk to the milk collection center before bacteria levels rise too high.<sup>47</sup> RDCP II facilitated the creation of associations to link existing transporters together, so they could offer their service in bulk to a cooperative's member farmers. This way a single transporter can carry the milk from three to five farmers in a given area at the same time, reducing transport costs for producers and helping their milk reach the MCC on a more reliable timeframe. It also increases the utilization of the transporter's capacity, providing a win-win business model. Further, the transporter is equipped to test the quality of milk and assumes responsibility thereafter, reducing risks of loss to the producer.

On the consumer side, RDCP II has piloted with Inyange Industries, a large processor. Inyange has branded milk retail outlets/kiosks (termed 'milk zones') where pasteurized milk and milk products are sold directly to consumers in a standardized manner. These milk zones are operated by entrepreneurs who enter franchise agreements with Inyange to use the brand. Milk zones are sometimes completely new businesses, and sometimes already existing milk retailers that have decided to align with the milk zone brand. Inyange takes responsibility for testing milk quality at each milk zone, which compete directly with informally marketed dairy products sold at kiosks that do not follow comparable quality standards.

In summary, RDCP II's vision for a dairy sector that produces high quality milk and milk products is as follows:

- Processors enter into agreements with members of milk cooperatives to guarantee their supply of milk. Milk that is purchased by the processors must meet various conditions, including that it is supplied within two hours of milking.
- Cooperatives enter into agreement with transporters (groups of individuals who own bicycles) to organize farmers to supply milk on a schedule.
- Milk prices are negotiated and agreed upon for a certain period (e.g., 8 months).
- Rural MCCs receive the milk collected from farmers and test its quality before selling it onward to clients/processors.
- Local governments have clear guidance – via a ministerial order – on the expected quality standards governing milk production, transportation and retail and ensure its enforcement.
- The Rwanda Agriculture and Livestock Inspection Services (RALIS) inspects MCCs and provides guidance towards award of quality certification to the centers that meet the requirements. RALIS enforces the standards and will order changes to or even the closure of centers and processors who do not meet the ministerial order requirements.

This model is presented in the following results chain, which outlines selected impacts and the change process that RDCP II anticipates from its interventions in the dairy sector. The intervention assumes that the adoption of improved standards at the processor and cooperative level, combined with innovative business models for supporting and aggregating high quality milk from farmers, will enable small scale dairy farmers to more fully participate in the market. The wider market relies on government actors following through on their commitments to enforce the new standards through audits and actually shutting down businesses that fail to make the grade. This will require an investment of resources, time and ultimately political capital (to withstand any backlash from businesses that get shut down), which is a crucial assumption underpinning the entire theory of change.

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<sup>47</sup> The most common contamination sources have been identified and an acceptable threshold has been established for each.

## RDCP II RESULTS CHAIN

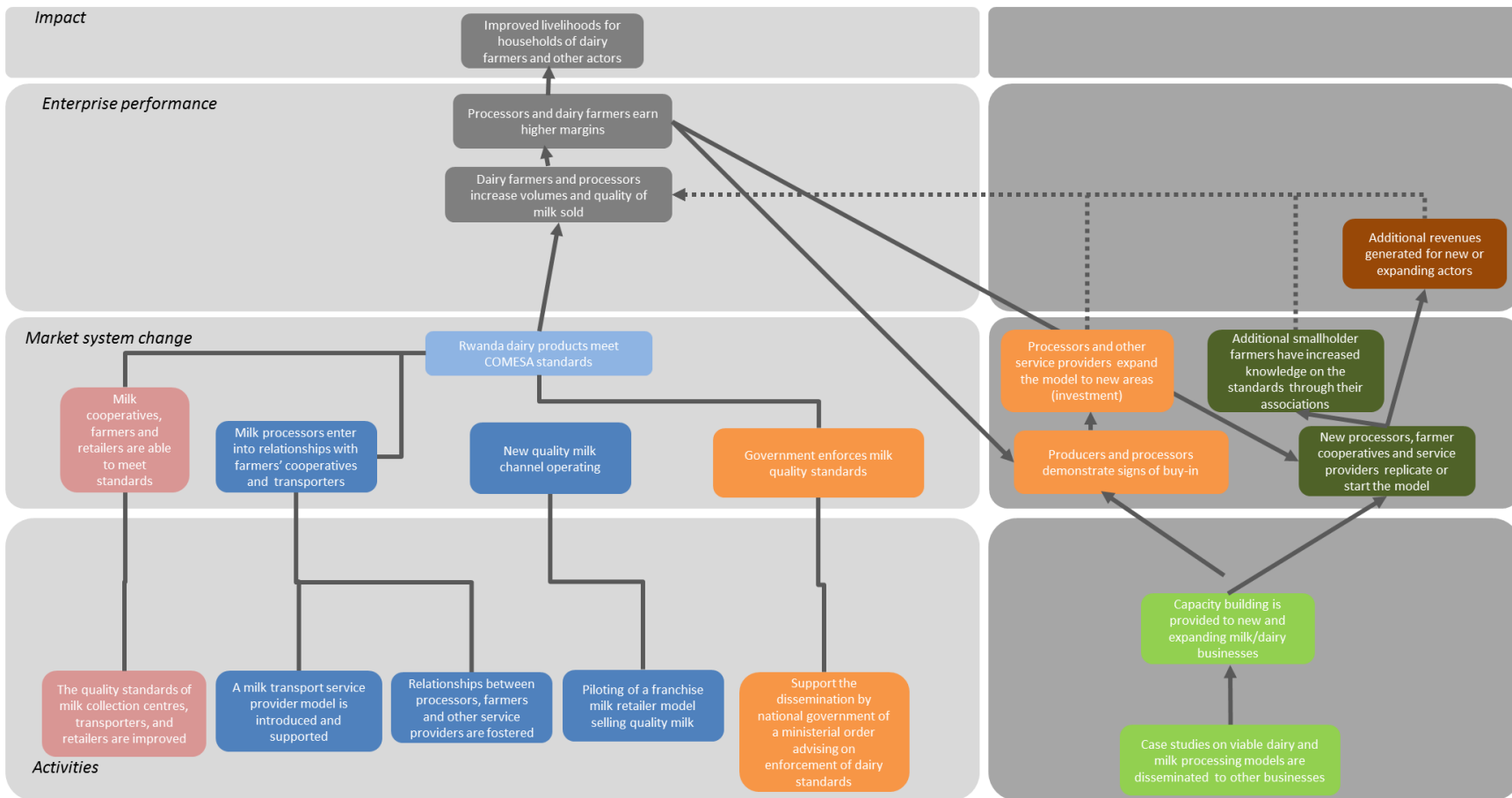


Figure 8. RDCP II Results Chain

To achieve the changes outlined in the above results chain, RDCP II's strategy has been to partner with a multitude of actors in the milk value chain, including processors, cooperatives, the Government of Rwanda, financial institutions and input service providers. RDCP II has undertaken the following activities:

- Working in close collaboration with the RALIS and the Rwanda Standards Board to develop a national pilot training, testing and certification program to enable milk cooperatives to achieve existing dairy quality standards.<sup>48</sup>
- Designing and implementing a communication plan to share information about the standards, with government buy-in. This included providing farmers and other actors with flyers and materials that displayed the basics of the standards on how to handle, transport, and process the milk. Milk transporters were organized and trained on how to handle and transport the milk.
- Attracting the interest of Inyange and other milk processors, the banks and other financial service providers to provide services and support to the dairy value chain actors.
- Facilitating discussions between cooperatives of milk producers and potential buyers.
- Supporting the development of early adopters of various new business models by coaching/training them and providing them with funds and equipment.
- Training MCCs and providing them with equipment to test the quality of the milk received from farmers.
- Coaching and mentoring staff at key MCCs and dairy processors to understand quality standards and make investments to be able to pass inspections.
- Facilitating the development and dissemination of Ministerial orders to actors in the milk sector on proper milk handling during the production, collection, transportation, and retail of fresh milk and dairy products.
- Generating buy-in from the government and private sector actors on implementation of and adherence to quality standards.

Several critical assumptions underpin RDCP II's interventions:

- All actors agree on the quality requirements for milk to be sold and how that quality will be measured. This includes trust that quality will be measured fairly and consistently.
- Economic benefits (e.g., higher margins, more consumers) result from providing good quality product and sanctions arise from poor quality.
- Banks and service providers agree to adapt their business models by providing customized services to milk producers, milk cooperatives, milk zone owners and other actors in the value chain.
- Strong support from the government to enforce quality measures as outlined in Ministerial orders at the national level and benchmarked against COMESA standards.
- Sufficient value is being created for the different actors to maintain their interest in adhering to the standards.

## EVIDENCE OF SYSTEMIC CHANGE

### Imitation

A key indication of imitation was the decision of a non-partner processor, Crystal Fresh Milk, to imitate major aspects of the model. Crystal Fresh Milk has entered into a contract agreement with farmer cooperatives to buy their milk and process it. The company has also established its own 'milk zone' (kiosk) outlets following in the steps of Inyange Industries. Crystal Fresh has started to train groups of farmers who supply them milk to follow the standards. They reported their motivation for doing so as wanting to have a secured source of supply. Crystal Fresh has trained its group of milk transporters to verify the quality of the milk before collection and get it to the MCC within a couple of hours. This is an imitation of activities initially undertaken by the project (training and set-up of transporter associations) which we can now see being imitated and taken up by the private sector. Its milk outlets are now apparently following the standards despite not having any direct support from RDCP II. They are now seeking additional support to expand their business, and have been offered financing to purchase the equipment needed to process and package milk.

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<sup>48</sup> National and COMESA standards already existed at the start of RDCP II, but had not been widely adopted.

Another example of imitation was the decision of milk zone owners, who were not part of the initial group of owners supported through the program and those who set up their business after the project support ceased, to meet the new quality standards. They found that this was required to work under the Inyange franchise, as the company is refusing to work with owners who do not do so. This is an excellent signal that quality standards are playing a role in influencing market actor behavior, and that key value chain actors (processors in this case) are becoming de-facto enforcers of the standards rather than relying solely on the government agency to do that vetting for them.

### Buy-In

As per the model introduced above in Section II, each aspect of buy-in is presented and analyzed here.

**Satisfaction:** At this early stage, all actors are satisfied with the implementation of the standards and the agreement they have had with other actors in the chain. However, it is still early in the audit process, and any businesses that do not do well may ultimately prove dissatisfied with the model. No visible resistance was expressed by any of the actors who were interviewed. The government expressed strong satisfaction with how the standards have been adopted to date. It has given six months to all businesses to comply with the standards. After the six-month period, audits will be led by the RALIS and businesses which do not meet the standards in the way they collect, process, transport or store milk and dairy products will be closed.

Farmers were satisfied that they were able to sign agreements with milk transporters to get their milk to the MCC less than two hours after milking. They are also satisfied with the agreements they signed with MCCs as they are certain to sell their milk at a set price without risk of the milk spoiling before they could find another buyer.

Milk transporters are satisfied with the training they received and the agreement they had with farm cooperatives and MCCs through the pre-existing Milk Sellers' Association, which is a member cluster of the Rwanda National Dairy Platform, through which they have pledged to support the implementation of dairy standards. They are also better able to predict their revenues as they know the quantity of milk that will be sold and the percentage they can get out of it if they follow the rules. Finally, MCCs are happy as they are more likely to have quality raw milk delivered every day and they can better predict their revenues.

**Continued use:** Actors that were interviewed claimed to be continuing to use the standards and the model as taught from the project. Although the trainings with farmers, transporters and processors took place a couple of years ago, the researchers had the opportunity to see good practices sustained in the field.

Farmers now follow good hygiene standards when milking their cows. The rationale for this is that tests at the MCC show that the milk received is meeting the required quality standards. However, this assumes that testing is done properly and results are not tampered with, something that was questioned in the Mid-Term Evaluation when certain MCC's reported 0% rejection rates.<sup>49</sup> The actual rate of compliance with the new system will be monitored as the government begins its audits.

Milk zones have followed suit. During the fieldwork for this research the standards continue to be displayed on a notice board in all milk collection centers and cooperatives that were visited. Inyange is monitoring its milk zones for compliance with the standards. This is a very interesting practice as it signals self-regulation in advance of external auditing by RALIS, who will be auditing the milk zones to see if they comply with the standards. The government has started to audit milk processing and selling units and deliver certificates of conformity. It has also continued to emphasize the importance of the standards to market actors by issuing a note directing all actors to use them.

The milk collection center in Ngondore is being revamped to meet the standards, and Blessed Dairies has also since upgraded all of its milk kiosks to meet the standards. Milk transporters have consistently been using the standards to collect and

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<sup>49</sup> RDCP-II Mid-Term Evaluation Report.

transport the milk. The quantity that is being rejected for non-compliance by MCCs from transporters has been steadily dropping and is almost nil. The system will likely continue to be used since all the actors are happy with it and are continuing to use it despite no longer receiving any significant support from the project. They are now paying for all their operating costs.

An important factor supporting the continued use is that the new system brings significant financial benefits for the processors. By outsourcing the collection system to transporters, it reduces their logistical costs while maintaining the reliability of the supply chain. The standards have allowed some of the dairies to clearly prosper. Blessed Dairies' investment in Hazard Analysis Critical Control Point (HACCP) certification – paid for by the company itself – has contributed to an over 400% increase in sales (to 100,000 liters of milk per day) through its milk collection centers. Blessed Dairies has also expanded its client base to include quality-conscious companies like RwandAir, the nation's largest airline carrier, and has started to sell its products in neighboring countries. Part of the business's success in getting the certification and expanding its volumes has been investment in dairy processing technologies as well as working with equipment manufacturers and RDCP II staff to secure cooling tanks, pasteurizers and machines for yogurt production.

**Adaptation:** Many aspects of the model are working as they were originally introduced. Milk producers who have been supported are using the model as it was engineered by the project: they are members of a cooperative that sign an agreement with the milk transporters and with a MCC. Milk is then delivered from the farm to the MCC by the transporters. One observed example of adaptation of the model – which does not directly relate to the milk quality standards that the project supported – was that Inyange began allowing customers to bring their own containers to purchase milk. Inyange used to sell milk in customized packages, which had a higher cost per liter. Now they have adapted to customer demand and in all milk zones are using large coolers (1000 or more liters) so customers can bring their own containers to the milk zone, and get milk at a reduced cost (as much as 40% lower). This adaptation demonstrates that the firm is learning about customer preferences through the milk zone retail model, and adjusting its products to better fit demand.

**Further investments:** In order to improve milk quality, almost all the actors involved in the chain have had to make further investments. Some were initially supported by the project, such as Blessed Dairies, which received one large tank from RDCP II to collect the milk from the MCCs, but has since bought four more tanks and other equipment to increase its capacity to process the milk. Blessed Dairies has also invested in its processing facilities and is now processing milk into butter, cream and cheese. Inyange is working with investors to purchase a larger processing unit and the equipment to transform the excess milk into powder. MCCs are also making further investments. A milk collection center in Ngondore is being upgraded by the farmers themselves to meet the standards, a sign of farmer buy-in and the willingness of cooperatives to invest. Milk collection centers that were visited during the case study were purchasing testing material to test the quality of the milk on the local market.

The government is preparing to conduct a nationwide, annual audit of the milk collection centers to ensure they follow the standards, which will require significant resources, none of which will be provided by the project.

**Replication:** A primary example of replication is by Inyange, RDCP II's primary partner processor. RDCP II's pilot with Inyange started with just a single milk zone, but the company has since replicated the model with dozens of milk zones independent of project support. After its initial imitation, Crystal Fresh has continued to replicate the milk zone model, expanding its milk retail outlets.

### Other Indications of Systemic Change

There are signs that the model has been institutionalized. The government is supporting the implementation of quality standards and milk processors are now following them. This is a powerful force for sustainability as it creates a new competitive norm for new entrants into the dairy sector. New milk zones are following the standards too because, according to some interviewees, people would prefer to buy their milk from places that look as nice and clean as the ones supported by Inyange and Crystal Dairies. The RALIS and district-level veterinarians are also now enforcing the implementation of the standards and encouraging local businesses to follow them.

Additionally, the project facilitated greater participation of women in the value chain. Traditionally, women did not own or milk cows in Rwanda, both of which have begun to change. RDCP II included both men and women in their meetings and trainings, which created some tensions initially but eventually became accepted.

Growth in production and prevalence of contracts between cooperatives and collection centers has enabled farmers' cooperatives to secure contracts to sell their milk across the country. Processors are now selling some of their excess production in neighboring countries such as DRC and Uganda, expanding regional markets for Rwandan milk. At the same time, the development of the milk collection centers and milk zones on the retail side has also boosted consumption and increased the size of the domestic market. Financial institutions have started to respond to the growth of the sector by developing tailored financial products, such as the loan product that Opportunity Bank has developed for Crystal Dairies. This has begun to restore trust among bankers who previously were skeptical of the creditworthiness of dairy sector actors given the non-performance of loans from the Rwandan Development Bank to MCCs.<sup>50</sup>

## CONCLUSIONS

Key conclusions which have emerged from this work include the following:

- RDCP II demonstrates the error of assuming that policy enforcement need always be initiated by government action. In this case, it was critical to first demonstrate that value chain actors could enforce quality standards, and that there was significant support within the industry for quality standards. In other words, RDCP II's work with the private sector helped to shape a norm that quality standards were important and good for business, which made it feasible for the government to act. This was undoubtedly facilitated by RDCP II's strategy of creating positive benefits to providing quality milk – introducing a business model reaching a quality-conscious market segment – before emphasizing punitive action for non-compliance. Getting buy-in from the top two processors in the country was instrumental to pushing other actors to adopt the standards and incentivizing imitation by other businesses.
- Nevertheless, government enforcement of quality standards is critical for institutionalizing and reinforcing this norm across the industry, particularly in the informal sector that could potentially use price to undercut the quality-conscious market segment. The as-of-yet incomplete institutionalization of the milk quality enforcement mechanism is the biggest potential threat to the maintenance of the quality upgrading that RDCP II has supported. Given the limited time between when the ministerial order was enforced and the date of the case study, it is still unclear whether the government will fully embrace its role as an enforcer of standards, particularly if it meets significant resistance from the informal sector or others.
- Also, the conditions in Rwanda were conducive to the enforcement of standards and the belief that this was a realistic outcome. Rwanda's government has a history of enforcing standards in other industries and a reputation for competency, which gives it credibility with industry players.
- This case study also demonstrates how the conditions favoring systemic change can vary even within a country. Kigali has a large number of middle and upper class, time-pressed consumers who were able to pay for quality milk once they valued it (and of course once the overall dairy system had evolved to enable this through extensive changes in quality management at the farm, collection points, and transporters). It was therefore logical that quality pasteurized milk was initially provided for sale in Kigali. While the upgrades to the MCCs have meant that the milk they supply in rural areas is also of higher quality than before, to date rural consumers do not have access to the high quality milk that can be obtained from the milk zones. However, a number of the other products introduced to the market in the previous five years – yoghurts and cheese in particular – do make their way outside of Kigali to district centers and peri-urban (some even rural) markets.

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<sup>50</sup> Mid-term Evaluation.

- Lastly, the connectedness of RDCP II to other development programs was important to its success. The project leveraged the momentum provided by the one-cow-per-family program to boost milk production and utilized the capacity of the Rwanda Standards Board to train and mentor RALIS for the pilot national certification program.



## D. GHANA: SYSTEMIC CHANGE STUDY ON ADVANCE II

### SUMMARY

Feed the Future Ghana ADVANCE II is increasing the competitiveness of the maize, rice and soya value chains in northern Ghana. ADVANCE II achieves this through boosting agricultural productivity, improving value chain actors' access to markets and finance, and strengthening local capacities. The project has been promoting and fostering the growth of outgrower businesses, changing the structure of aggregation systems for input and output markets in northern Ghana, improving terms of trade for smallholder producers and opening up a business model through which financing and other agricultural services can more effectively and profitably flow through the system.

**About the Project:** ADVANCE II is a five-year project implemented by a consortium led by ACDI/VOCA, with Technoserve, PAB Consult and ACDEP as the partners. The project is expected to reach over 113,000 smallholder farmers by end of 2018. Outgrower businesses (OBs), which ADVANCE II is promoting, are a relatively recent niche in the grains industry in Ghana. They function as a bridge between larger input, service and off-taker institutions and smallholder farmers.



*Loading grain into the warehouse of one of the outgrower businesses supported by ADVANCE II*

**Key Findings** include:

- ADVANCE II effectively illustrates the critical elements of systemic adoption and adaptation as market actors continue to innovate in response to changes in the market and their own learning experience. A robust set of activities initiated by ADVANCE II is being replicated by system actors with no support from ADVANCE II or other projects. The level of innovation, imitation, copying, buy-in is extensive, and supported by a relatively stable and competitive enabling environment. The growing number of OBs that do not work with any project and those who are expanding without project resources indicates that OBs are a systemic change in cereal markets in Northern Ghana.
- The field work found significant evidence of buy-in of innovations in smallholder practices, OB services, modification to input and service provider business models and in communications between off-takers and their suppliers. In each instance, there was clear evidence of satisfaction, at least with part of the innovation. Continued use is more difficult to detect given the short time that ADVANCE II has been operating but there are enough instances of satisfaction that users of the new innovation are expanding their use of the innovation through new investments and new actors are copying whole or in part. In addition, an ADVANCE II survey showed revenues increasing by 13 percent from 2014 to 2015, indicating continued use is profitable.
- There is much copying among each of the system actors, demonstrating replication. As of October 2016, ADVANCE alone was working directly with 368 OBs (more than double that in 2014), who collectively aggregate product for over 100,000 farmers and provide input credit to nearly 43,000 of them<sup>51</sup>. OBs are also expanding and beginning to mentor other weak, new, or aspiring OBs. Recently, OBs in Upper West, Upper East and Northern regions decided to form one OB network in each region to undertake advocacy activities and exchange experiences.

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<sup>51</sup> These figures only reflect farmers engaged in the ADVANCE project; OBs also work with other farmers, although the project does not track this in its data monitoring systems.

- There is anecdotal evidence that adoption of the OB model in Northern Ghana may have reached a tipping point beyond which the innovation process is likely to continue to expand on its own. There is a considerable level of copying each other’s innovations, adapting them to their own use, replicating these and crowding in by new actors in the system.

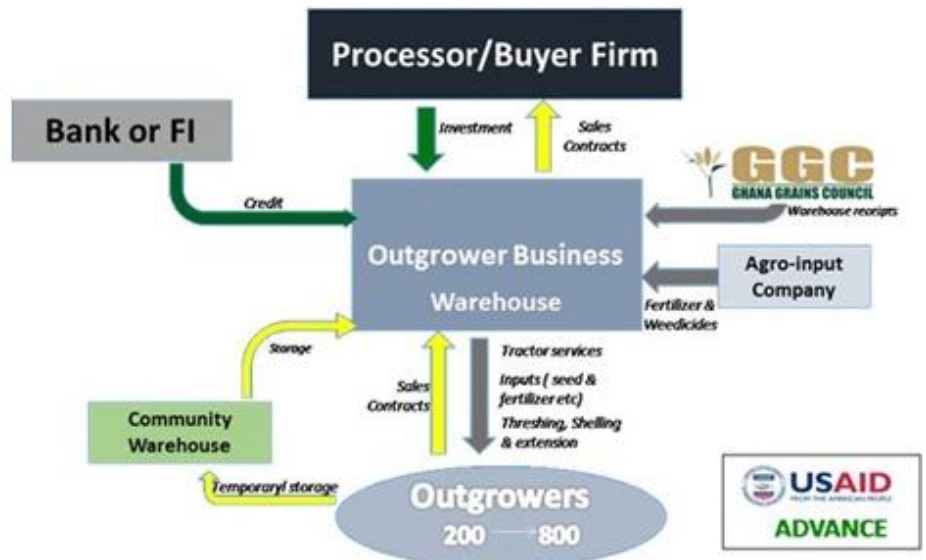
**CONTEXT**

Ghana has, at least in relative terms, has created a robust enabling environment for the systemic transformation of its agricultural sector. At the same time, there remain a number of constraints that augment smallholder risks particularly in the context of climate change, such as high interest rates that prevent borrowers from increasing their investment.

Commercial seed markets are weak, yet there is considerable movement and innovation in models and approaches to build bridges between private input companies and output buyers and smallholders. Yet, like many of its neighbors, Ghana continues to struggle to find a balance between developing a robust and private sector seed market for its own and imported varieties while meeting its plant protection obligations. As a result, maize yields, especially in the north of Ghana, remain a fraction of what smallholders could and should achieve if a private and well-regulated seed market was allowed to emerge<sup>52</sup>. Further, there is not a market system that can rapidly multiply and commercialize drought tolerant varieties.

**PROJECT STRATEGY**

ADVANCE II has focused on the OB model (see Figure) as a bridge between input companies and output market buyers for farmers’ product. The OB is an adaptation from ADVANCE II’s predecessor project, recognizing the importance of a more commercially focused and resource endowed linkage between actors on the input and output side of smallholders and the smallholders themselves. OBs bridge smallholder farmers to service providers lacking mechanisms or services adapted to reach large numbers of service providers and buyers lacking mechanisms to ensure the volumes and quality demanded by their buyers. They also function as service providers, offering tractor services, short term input financing, post-harvest shelling and rudimentary extension services backstopped by the Ministry of Food and Agriculture’s extension specialists. OBs have existed for some time in Ghana, but were mostly focused on aggregation of produce as well as tractor services provision (if any). ADVANCE II grew this model substantially, and encouraged additional services ‘scaffolded’ on, such as input credit and extension. So, by working with ADVANCE II (and its predecessor project ADVANCE I), OB Aswaba Farms provides a wider range of services to his outgrowers.



*Source: Author adapted from ADVANCE II archives*

**Figure 9. Outgrower Business Model**

<sup>52</sup> The seed situation is changing in Ghana, albeit slowly. PANAAR and Pioneer hybrids have been tested and certified, though not yet gazetted. Hybrid seed of certified varieties are being imported but there is no domestic production of these seeds at this time.

Smallholder farmers directly or indirectly supported by ADVANCE II are organized into groups. Under the model, OB's receive assistance in the delivery and management of services to groups of smallholders, farmer groups are used by nucleus farmers and OBs for economic and efficient delivery of input and extension services, in the aggregation of farmers' product to fulfill contracts, and to assist in the enforcement of contracts.

For example, Mohamad is an outgrower businessman based out of Asawaba Farms, and currently works with 820 outgrowers, 40% of whom are female, based throughout the Tolon and East Gonja districts. As he expanded his OB, he has added additional services, from providing crop protection inputs and fertilizer to now including extension, ploughing and harrowing, as well as pre-financed inputs for 200 of his best outgrowers. Mohammed and other OBs generally sell to the larger millers in the region – overall, major processors and traders who work through OBs include Agro-Business Services (ABS), Premium Foods, and Akate Farms. Some of these, such as Akate Farms, also provide financing to OBs. John Deere supplies tractors and farm equipment to outgrower businesses who either purchase directly or arrange financing through banks such as the Sinapi Aba Trust. Mohammed believes he will continue to provide services to his outgrowers even without ADVANCE II or other donor funded projects. He now sets aside funds for the depreciation and maintenance on his equipment, and indicated that recently all the OBs in his association have promised to do the same thing. He credits ADVANCE II for much of his success.

## EVIDENCE OF SYSTEMIC CHANGE

Through interviews and focus groups with market system actors in the maize trade, from smallholder farmers downstream to off-takers and service providers, this study observed widespread imitation, adaptation of imitated models, investment in expanding innovations, and replication by actors not affiliated with any program public or private. Through the strength of weak ties (SWT), bridges have been formed between input companies and off-takers to groups of smallholders. Through these bridges, OBs are introducing innovation into groups and associations of smallholders, and within these groups of smallholders, innovations are being adopted at differing rates depending upon whether a particular farmer is her/himself an innovator, an early adopter, a member of the early or late majority, or a laggard. Each of the critical elements of systemic change can be found in the behavior of various value chain actors including imitation, satisfaction, buy-in, continued use, and further adaptation of innovations introduced into the value systems in which the project is operating. It is clear that ADVANCE II is operating as a catalyst and an accelerant in this robust system, introducing innovations at a much faster rate than the market would on its own. At the same time, the question must be asked of activities heavily subsidized by ADVANCE II, such as its equipment cost sharing grants, whether said grants are stimulating demand through demonstration, demand which will continue to expand after the project, or whether demand at full cost actually exists.

### Imitation

There was substantial evidence of copying occurring by actors interviewed and reporting of copying by other actors not included in this assessment. This is facilitated through both formal and informal networks. For example, many OBs have recently formed an association in their region with support from ADVANCE II. As of October 2016, ADVANCE II alone was working directly with 368 OBs (more than double that in 2014), who collectively aggregate product for over 100,000 farmers and provide input credit to nearly 43,000 of them<sup>53</sup>. OBs are also mentoring other weak, new, or aspiring OBs: in FY16, 25 OBs were mentoring 125 individuals, up from 10 OBs mentoring 78 individuals in FY15. This is a behavior the ADVANCE II project actively encourages, building on the fact that many OBs are community leaders, which traditionally have a cultural role in mentoring others.

There appears to be broad convergence about the potential of the outgrower business as an effective bridge between off-takers, input companies, and financial institutions and the large number of smallholders to whom they offer an increasingly robust bundle of services, from whom they aggregate a volume of product that clears their repayment obligation for services rendered. With access to good agricultural practices (GAP) and tractor services, smallholder farmers appear able to double their

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<sup>53</sup> These figures only reflect farmers engaged in the ADVANCE II project; OBs also work with other farmers, although the project does not track this in its data monitoring systems.

yields. This seems a sufficiently strong incentive for multiple market system actors to copy or innovate in order to offer improved services to smallholders or to the OB that functions as a 'bridge' to them. The doubling of smallholder yields is occurring for the most part without widespread access to hybrid or otherwise highly productive maize seed.

ADVANCE II is also starting to see some copying and crowding in amongst financial institutions that are part of the OB model. For example, Sinapi Aba Trust (SAT), a licensed bank, is financing OBs and informs smallholders of credit opportunities and tractor services available from the OB. Payment for services is undertaken by the OB on behalf of its smallholders to SAT. At harvest, OBs receive repayment in kind from their smallholders which is then sold to offset smallholder liabilities at SAT. The Trust has provided credit to about 7,000 ADVANCE II-assisted farmers since 2013. The financial institution believes its support to producers is transforming its own operations in rural communities. SAT benefits from the relationship with ADVANCE II through expansion of its loan portfolio. It also derives income from servicing farmers to enable sustainable operations. In 2015 three other banks started attending meetings with ADVANCE II to develop similar strategies – UT Bank, NIB, and Fidelity Bank.

## Buy-In

### Satisfaction

Many of the OBs, product buyers, and outgrower farmers reported a high level of satisfaction. Additionally, an ADVANCE II survey showed revenues increasing by 13 percent from 2014 to 2015, indicating continued use is profitable. As a result of the access to markets and financing the OB provides, many farmers are seeing a significant increase in yields and a reduction in post-harvest losses. Non-participating farmers fell into two categories. The first were adopting elements of GAP from their neighbors or farmers in nearby villages; this was surprisingly common but produced less than optimal results<sup>54</sup>. The remaining set of non-affiliated farmers reported that they did not have access to inputs or information as to how they could improve their performance.

### Adaptation

This study found some examples of adaptation taking place. For example, Wumpini Agro Chemicals is an input supplier that serves northern Ghana. Wumpini changed its principal business model from wholesaling inputs to small community level retail agrodealers to direct marketing to smallholders through their associations and OBs. Based on lessons learned from women's farmer groups that buy from them, Wumpini initiated solidarity group input supply depots in targeted communities. While this has been frustrating to a number of village level retail agro-dealers, Wumpini believes them to be obsolete and less service oriented than its current links to farmers through the input supply depots. Wumpini believes many agro-input companies are copying its business model and that their partnership with ADVANCE II has been beneficial.

### Replication

During the field interviews, this study observed that some smallholder groups were copying successful practices even though they were not working with an outgrower business. Further follow up verified that some clusters of smallholders adopting GAP and or postharvest innovations had not heard of ADVANCE. One of these had heard of ADVANCE but not worked with the project. This smallholder cluster worked with an OB which received support from ADVANCE, but was continuing to expand its activities on its own. This suggests adoption and replication by the OB on its own, as well as by the cluster of smallholders not associated with ADVANCE.

### Further Investment

OBs in Upper West, Upper East and Northern regions decided to form one OB network in each region to undertake advocacy activities and exchange experiences. The formation was supported by the project, but the set up was at their initiative and

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<sup>54</sup> The reason for lower performance by farmers who copied those supported by ADVANCE might be the lack of follow-up to ensure that the copying farmers had full knowledge of the improved practices. This, however, could not be tested.

were the first OB networks in Ghana. In addition, the Bonzali Rural Bank, which provides banking services to rural communities in eight districts of the Northern Region, is financing OBs to acquire tractors to provide land preparation services to smallholders. Other banks are now realizing the viability of the sector and copying its business strategy.

## CONCLUSIONS

ADVANCE II effectively illustrates the critical elements of systemic change, including widespread evidence of adoption and adaptation of a structural innovation, i.e. the growth of OBs as intermediaries in a market system, as well as the use of improved agricultural practices diffused, at least partially through the OBs. Much of the widespread imitation, adaptation, and replication by different value chain actors can be directly attributed to ADVANCE I and II interventions, or indirectly by actors copying what they learn from ADVANCE partners. At the same time, there is so much crowding in by multiple actors and learning from multiple other actors that some attribution cannot be determined.

The OB-smallholder model has grown rapidly and appears to continue to grow on its own. While it was outside the scope of this assessment, the ADVANCE OB model may have reached a tipping point where it will continue to expand and evolve without additional resources, though unlikely to expand at the same rate. The level of buy-in and imitation by multiple value chain actors is almost dizzying. The high level of women's participation in these schemes is a positive surprise. Women have a deserved reputation for being more likely to honor financial obligations so some OBs have initiated their operations with women's groups.

In interviews with farmer groups, female members reported reduced dependency on their husbands on account of increased incomes from implementing the new farm practices. The new wealth in the community is evidenced by conversion from thatch to aluminum roofing sheets on their houses. Off farm, group members now have more resources and time to engage in other activities such as trading, dressmaking (especially by females) and other microenterprises including photo-copying, mobile device charging, and managing cash transfers on mobile devices. A number are upgrading from bicycles to motorbikes.

How well does the ADVANCE II case support the theory of change posited earlier in this paper in Section II? ADVANCE relies heavily on elements of weak ties posited by Granovetter. Principal among them is the use of OBs as bridges between smallholders and the private actors supplying them with inputs and aggregating their surplus. In some cases, members of smallholder groups introduced new groups to their OB, illustrating weak tie bridges between one group and another. In other cases bridges between one group and another resulted in the adoption of innovation by the second group without a link to an OB.

Early on the ADVANCE II team recognized that it could not train all the members of any group and it needed to identify innovators and early adopters within those groups who, once trained, would use their own farm as a demonstration for their neighbors. The level of adoption of new practices clustered around 67%. This approximately follows the literature on diffusion theory which posits that 1/3 of a sample will fall into the late adoption category and 16% as laggards are more averse to change<sup>55</sup>. Important from a resource allocation perspective, 67% adoption significantly exceeds the tipping point at which the early and late majority of actors will adopt the introduced technology on their own. This seems to be borne out by the broad and deep evidence of imitation, crowding in, and replication.

Finally, the abundance of systemic change behavior begs the question, why? What is different about Ghana? Although this is beyond the scope of this assessment, the authors posit two hypotheses. The first is an enabling environment in which it is relatively easier to do business in Ghana than in neighboring countries (see Table 2). The second is that Ghana has relatively weak producer organizations. Cooperatives are very weak and the average size of farmer organizations is around 20 members.

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<sup>55</sup> USAID's FTF indicators have a broad definition of new technology adoption. Using this broader definition, over 99% of ADVANCE clients have adopted at least one new practice over the life of project to date.

Grannovetter might posit that the strong ties linking members of a community tend to stifle innovation at the expense of promoting collective compliance with group norms. Perhaps the relative weakness of collective groups, and the fact that these groups are linked through weak ties to outgrower businesses, is an advantage.

## IV. BENEFICIARY SPOTLIGHTS

Profiles of key project beneficiaries are provided in the following pages, for each of the cases explored above. These are designed to spotlight individuals who have benefitted from the broader systemic change processes outlined in the full case studies in Section III.



## SENEGAL NAATAL MBAY: SPOTLIGHT ON MBODJ & BROS

*This snapshot profiles a beneficiary as part of the Feed the Future Senegal Naatal Mbay project. Naatal Mbay is a large-scale, market systems development project targeting the rice, maize, and millet value chains in the Senegal River Valley and the South Forest Zone. Naatal Mbay is facilitating changes at a systemic level in two key areas: revamping the prevailing contract farming system in paddy rice by introducing a more inclusive, competitive model, and introducing agricultural equipment leasing into a new geographic area, tailored for a new category of clients (millers and processors). This snapshot is part of a broader report which captures case studies of how FTF is facilitating systemic change in four priority countries: Senegal, Ghana, Rwanda, and Zambia. Access the full report at: [www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future](http://www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future).*



*Alioune Mbodj standing in front of product stocks*

Ibrahima Diop is a happy farmer. He has produced seven tons of rice in the past season, five tons of which he has sold through the enterprise Mbodj & Bros at 125 CFA per kg. With the money from the sale, Ibrahima was able to repay the loans he had taken out to grow rice, have extra cash for investment and meet his family's needs. His cash-on-hand income rose 40% from the previous year. Ibrahima achieved these goals thanks to a system of contract farming set up by the EIG and other local businessmen. For three years, Mbodj & Bros have been operating a system of contract farming for rice cultivation facilitated by the Naatal Mbay project (and its predecessor, PCE), described in detail in the full case study referenced above. Farmers and other stakeholders within the system meet at the beginning of the season and agree on a fixed price per kg of paddy rice. Based on this price, each farmer assesses his/her

input and agricultural service needs. These needs are then studied by the outgrower businesses (OB) who offer loans to farmers to cover all or part of the costs. The loan is repaid in-kind in paddy rice after the harvest<sup>1</sup>. Around 800 farmers like Ibrahima have benefited from the system. (As covered in the case study, the 3 processors interviewed for the study are now supporting over 3,000 smallholder farmers annually, compared to approximately 400 that they used to support before. Additionally, 20 processors and small-scale millers are participating in the system, allowing for in-kind reimbursement, with over 55,000 tons of paddy worth \$12 million estimated by the project in the 2016 dry cropping season).

According to Alioune Mbodj of Mbodj & Bros, there is great demand by farmers for the contract farming model promoted by Naatal Mbay due to its flexibility and potential benefits to be reaped by

<sup>1</sup> In the case of climate shocks and widespread crop failure, the majority of farmers also benefit from the presence of a national crop insurance program.



farmers and their groups. Two years ago, Mbodj & Bros began to lease a large rice-processing unit from Locafrique, an equipment leasing company, using the rice paddies of Ibrahima and other farmers to ensure its profitability. In order to improve their productivity, the group entered into contract farming with them by providing soil preparation, inputs and advisory services during the production season, thereby a high quality of rice to be processed and then sold on the local market.

The partnership between Mbodj & Bros and Ibrahima is not a new one; a major change in their relationship was prompted by the Naatal Mbay project and the Locafrique group. Given that farmers in the area can produce more and better rice than the group but were limited by poor access to high quality inputs and agricultural advisory, the project brought together stakeholders in the rice sector such as Ibrahima and his friends. These discussions highlighted one of the problems faced by farmers, which was the lack of access to credit due to uncertainty of their produce sales.

This uncertainty was due to the variable quality of their produce that made it impossible to make income projections and thus access credit. As a result, Naatal Mbay sought to simplify and raise awareness about the stages of production and rice quality standards. The adoption of these stages and standards led to an increase in the quality of local produce and boosted demand for it<sup>2</sup>.

Seeing the market develop, Mbodj & Bros group decided to work to acquire a rice-processing unit and increase their production capabilities. Locafrique, which started out as a vehicle leasing company, saw a great opportunity and decided to branch out into the new market of agricultural equipment. Following inquiry, it convinced Mbodj & Bros and four other large outgrower businesses from the area to lease the units. Locafrique now works in the area to see its rice processing units as well as other items of agricultural equipment, according to local needs. Furthermore, Locafrique has set up simple repayment terms which have helped to grow sales of its products. In addition to the inputs he gets from Mbodj & Bros, Ibrahima is also able to avail of Mbodj & Bros' agricultural advice services from staff that were recruited and trained during the project. Ibrahima's production saw a huge increase, with yields growing from three to five tons per hectare, as well as a reduction in post-harvest losses thanks to better management practices.

At the same time, thanks to the support of the project, the Mbodj & Bros group was able to professionalize considerably which contributed to them developing a partnership between Ibrahima and his friends. The group built new premises, set up a transparent accounting system and a comprehensive, up-to-date database of all the farmers in the area with which it had contracted. In turn, Ibrahima and his friends benefit from the increase in their incomes and believe that the system will help to positively transform their lives and their families. Mbodj & Bros aim to repay the cost of their processing unit and continue to offer their services to all farmers who want them. Locafrique aims to sell equipment in the area and plans to expand its activities into agricultural banking, offering financial products and services to rural stakeholders.

Ibrahima and the benefits he is getting from the contract farming relationship with Mbodj & Bros is but one example of the impact seen from Naatal Mbay's efforts to facilitate systemic change in the rice system through changes in contract farming models and equipment leasing. For more on these broader changes, read the full report, *Case Studies on Facilitating Systemic Change in Feed the Future*.

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<sup>2</sup> At the time of this study, the project was training technicians directly, and initially subsidized their salaries, but this subsidy was ending, and the project is planning to end subsidies. Additional follow up work would be valuable to determine the impact of this on sustainability.



## ZAMBIA PROFIT PLUS: SPOTLIGHT ON JASADON PRODUCER COMPANY

*This snapshot profiles a beneficiary as part of the Feed the Future Zambia Production, Finance, and Improved Technology Plus (PROFIT+) project, a market development initiative that targets a range of value chains including maize, soybean, groundnut, and sunflower. PROFIT+ is introducing changes in the structure of the localized rural input supply system through new actors (community agro-dealers) and aggregation models (CAD-owned 'producer companies'). While in the early stages - and compounded by the context of two years of heavy drought, which has led to shifts in behaviors from those that are revenue maximizing to those that are risk mitigating and resilience maximizing – these structural changes in the system are beginning to improve smallholder access to input and extension services. This profile is part of a broader report which captures case studies of how FTF is facilitating systemic change in four priority countries: Senegal, Ghana, Rwanda, and Zambia. Access the full report at: [www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future](http://www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future).*



*Community agro-dealers engaged with PROFIT Plus*

Over the past three years, several community agro-dealers (CAD) in the Chipata area began selling inputs to their neighbors after participating in trainings with PROFIT+ in how to build and run a retail agroinput shop. While they found these shops successful, there were still several challenges they faced. They were still faced with liquidity problems—lending rates were too high, and banks were wary of lending them enough to make a significant difference in their operations. Without enough money, they could only

offer a limited range of products to farmers in limited quantities. Their margins were slim, partially because they were only able to buy small amounts of stock, but also because for small quantities they could not get bulk discounts from suppliers, and had to pay transport costs to their shops.

These CADs knew they had to grow their businesses to remain viable, but individually could not manage or finance enough expansion. Working with PROFIT+ technical advisors, they came together to form an umbrella Producer Company (PC). As opposed to an association, this company is a separate entity from each of their retail shops, and they each invested capital and owned shares of the firm. PROFIT+ worked with them to develop a business plan and strategy. The sustainability of the CADs lies in the heart of the PC itself, and trainings are meant to build CAD capacity to a point that they can sustain and grow their new enterprises, providing a durable market point for inputs and offtake for smallholders in their area.

The Jasadon PC is focused on growing in two markets. First, they have leveraged their greater market share to secure wholesale discounts from input suppliers, reducing costs to their customers and establishing inventory credit lines with input suppliers, often with sellback guarantees. As a one-stop entry point to a network of five retail shops, input suppliers recognize that the producer company reduces their last mile costs. Jasadon can receive orders at their main warehouse, and distribute internally themselves to their retail points. Between their five retail shops, they have already sold to nearly 1,400 farmers this season, and are targeting to increase this number to 2,000 next season. In addition, different PCs and input suppliers have different arrangements in terms of how inventory credit schemes function, where return/refund policies on unsold stock are clearly outlined in their retailer agreements. Most suppliers offer buyback arrangements for any rainfed-crop related inventory unsold after the major planting season ends

Second, they have begun and are expanding a rotational outgrower and spot trading firm, picking up commodity from their network of smallholder input clients on credit or for cash, and trading it through the Zambian Agricultural Commodity Exchange (ZAMACE). As of June, they had purchased 12.5MT of soy, and 30MT of maize, but are targeting total purchase of nearly 100MT of maize this season, and smaller tonnages of groundnut and sunflower. Pooling resources, they have constructed a group warehouse where they can collect and aggregate tonnages purchased from their individual retail areas, and bulk to truck-fill tonnages to send to ZAMACE. Their outgrower scheme has worked initially with only 72 farmers, but next year they hope to grow larger if they can finance the seed. Towards this end, next season they are hoping to expand the goods they can offer to farmers, providing soy and groundnut seed multiplication to help build the local supply base and ensure farmers do not run out of high quality seed in future years, like they did this year for soya.

***Between the Jasadon PC's five retail shops, they have already sold to nearly 1,400 farmers this season, and are targeting to increase this number to 2,000 next season.***

Through expanding their input goods and services, and a guaranteed local market for key commodities, the producer company is saving customers time, increasing their yields and helping build the diversity and resiliency of local market systems in Chipata. For more on these broader changes, read the full report, *Case Studies on Facilitating Systemic Change in Feed the Future*.



## RWANDA RDCP II: SPOTLIGHT ON BLESSED DAIRIES

*This snapshot profiles a beneficiary as part of the Feed the Future Rwanda Dairy Competitiveness Program II (RDCP II). RDCP II is working to strengthen Rwanda's entire dairy value chain. The program is also playing a leading role in improving Rwanda's food safety standards for dairy, while raising consumer awareness about the importance of drinking quality milk. This case study highlights an early stage example of systemic change in the dairy industry, as RDCP II's efforts to introduce milk quality grades and standards into the industry, along with new aggregation and output models, is starting to alter the norms and practices of key actors (processors, outlet stores), building incentives for these behaviors up and down the supply chain. It is part of a broader report which captures case studies of how FTF is facilitating systemic change in four priority countries: Senegal, Ghana, Rwanda, and Zambia. Access the full report at: [www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future](http://www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future).*



*Milk is received at the collection center*

At first glance, Milton Ngirente looks like an ordinary businessman. However, he is far from that. Milton started out by purchasing milk locally and transporting it for sale in Kigali. He initially worked with an informal network of 25 producers. After several months of seeing Milton's determination, a group of milk producers decided to work together to provide milk to Milton. Several other producers joined the new group, which quickly grew from a membership of 200 to 350. In return, Milton offered the producers guaranteed sales of their product at a competitive price higher than the local rural market rate. Milton also managed to build a secure supply chain and a network of contacts in order to meet the market demand for milk. This network of small producers quickly grew to over 3,500 members with the increasing demand for milk.

This prompted Milton to begin processing milk targeted at a growing urban consumer demand for value added milk products. Thus in 2012, Blessed Dairies Limited was established with a focus on yogurt, cheese, butter and fresh pasteurized milk to the urban market. RDCP II began working with Milton during this period. The project supported Milton to expand his business by first providing him with a cooling tank to transport large quantities of milk and a pasteurizer to increase his processing capacity. Milton was one of the main operators in the sector to benefit from such support due to his dedication.

Inyange, the largest milk processing and sales company, became aware of Milton's business and offered to directly purchase a large quantity of fresh, unpasteurized milk from him. This was achieved following Milton's successful collaboration with RDCP II to pilot the 'seal of quality' program – an initiative of RDCP II prime implementer Land O'Lakes to work with milk producers and suppliers to improve the quality of milk through regular testing at aggregation and collection centers.

Milton then decided to begin processing surplus milk. He aimed to sell yogurt, cheese, butter and milk to Inyange and urban market consumers. RDCP II began working with Milton during this period. The project supported Milton to expand his business by first providing him with a cooling tank to transport large quantities of milk. Milton was one of the main operators in the sector to benefit from such a work tool.

RDCP II also helped Milton to structure his business, better manage his stock and comply with hygiene and quality standards. RDCP II worked with Milton and other milk traders to implement quality standards for the collection, transportation, processing and distribution of the milk. In collaboration with the Rwanda Agriculture and Livestock Inspection and Certification Agency (RALIS), which is responsible for certifying agricultural products, quality and hygiene. Dairy quality protocols were finalized and enacted by the Ministry. All actors within the value chain were asked to follow these measures; if not, they were to face sanctions placed by authorities. Milton religiously implemented RDCP II's innovations, which helped him become the first Rwandan dairy processor to secure Hazard Analysis and Critical Control Point (HACCP) certification in 2014. His business attracted the attention of investors and buyers, which increased demand for his milk.

Milton decided to self-finance three other insulated milk delivery tanks to increase his collection and distribution capabilities. In 2014 and 2015, Milton invested US\$150,000 in the purchase of modern processing equipment, including six cooling tanks, a batch pasteurizer, a second mobile insulated tank and an automatic filling and sealing machine for yogurt production. He currently provides Inyange with over 35 thousand liters of milk per day and also sells milk on the market through his distribution network. Following Milton's achievement, the Rwandan airline RwandAir has decided to purchase, through their distributor, Blessed Dairies' milk products for their inflight services. Blessed Dairies is now supplying 600 yogurt cups, 30 kilograms of fresh cream and 7 kilograms of mozzarella cheese to RwandAir each week.

### ***Milton currently provides Inyange with over 35 thousand liters of milk per day and also sells milk on the market through his distribution network.***

Milton currently works with over 8,000 milk producers and over 200 small transporters who collect the milk each morning from small rural farms and deliver them to the drop-off points in every district. Quality and hygiene standards measures are monitored across the entire supply chain, from the farm to the consumer, and any breach automatically leads to rejection of the entire batch. In collaboration with RDCP II, the milk transporters have been trained and equipped with testing kits thereby working as promoters of milk quality practices significantly reducing milk rejections in the entire coverage. Milton communicates with his suppliers through a network of MCCs and milk transporters who are in daily contact with the milk producers. The transporters have been instrumental in communicating and ensuring quality of milk produced. His network of suppliers is also linked to both private and public extension service providers, with a pre-selected list of providers at each location. Additionally, beyond milk hygiene, the processor and cooperatives have an extension outreach strategy that supports access to breeding and feeding technologies to further improve production per cow by linking with private service providers.

These quality standards are now adhered to by the majority of actors in the milk sector, which has developed Rwandan milk and milk product sales within both internal markets and neighboring countries. In 2015, milk was recognized for the first time as significantly contributing to the country's agricultural Gross National Product. Producers who benefited from One-Cow-Per-Family, a government dairy re-stocking program, were able to sell milk at a higher price, which improved their livelihoods and increased the contribution of the livestock sector to the development of Rwanda. Milton and Blessed Dairies' story are but one example of the broader change in the dairy system that RDCP II has facilitated. For more on these broader changes, read the full report, *Case Studies on Facilitating Systemic Change in Feed the Future*.



## GHANA ADVANCE II: SPOTLIGHT ON OUTGROWER HARUNA ALHASSAN

*This snapshot profiles a beneficiary as part of the Feed the Future Ghana Agricultural Development and Value Chain Enhancement (ADVANCE) II project. ADVANCE II is increasing the competitiveness of the maize, rice and soya value chains in northern Ghana. ADVANCE II achieves this through boosting agricultural productivity, improving value chain actors' access to markets and finance, and strengthening local capacities. The project has been promoting and fostering the growth of outgrower businesses, and through this, changing the structure of aggregation systems for input and output markets, improving terms of trade for smallholder producers and opening up a business model through which financing and other agricultural services can more effectively and profitably flow through the system. This personal snapshot is part of a broader report which captures case studies of how FTF is facilitating systemic change in four priority countries: Senegal, Ghana, Rwanda, and Zambia. Access the full report at: [www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future](http://www.microlinks.org/library/case-studies-facilitating-systemic-change-feed-future).*



*Haruna showing off his new aluminum roof, purchased with proceeds from his improved income from maize sales.*

Haruna Alhassan is a 38-year-old farmer who began producing crops at an early age of 12 with his father. Though he was unable to attend school due to his family's acute poverty and the need to contribute to their sustenance, he was able to attend evening classes with the non-formal education unit organized nightly in his community, Kurogu Vuhiyayili in the Tolon District in northern Ghana.

On the lookout for any opportunity to improve his circumstance, he learned of a farmer group at Kale in his district receiving assistance from Asawaba Farms, an outgrower business (OB) owned by Mohammed Zion, who provided assistance to farmers for repayment in kind at the end

of the production season. He travelled to Tamale to meet with Mohammed to discuss how he could benefit. Mohammed was happy to oblige his request and the result was formation of the Suglomali Nyori Farmer Group meaning "Patience is Wealth." Now after nine years<sup>1</sup> of hard work and steady relations with Asawaba Farms, Haruna and his farmer group are reaping the benefits of their dedication and readiness to learn new practices introduced by their outgrower business to improve their yields and incomes. The group has grown to 200 members including 91 women. It has a four-member executive with Haruna as chairman and his ardent childhood friends Brimah Baba as secretary, Baba Asana as

<sup>1</sup> The relationship between outgrower businesses and outgrowers has existed for some time in Ghana, but it was mostly focused on aggregation of produce as well as tractor services provision (if any). ADVANCE II grew this model substantially, and encouraged additional services 'scaffolded' on, such as input credit and extension. So, by working with ADVANCE II (and its predecessor project ADVANCE I), OB Aswaba Farms provides a wider range of services to his outgrowers.

treasurer and Baba Abdulai as organizer. The group pays monthly dues of GHS 4 (approximately 1 USD) collected quarterly at weekly meetings and have an unwritten constitution which has so far not created any misunderstandings in their behavior. They have, however, resolved to write down their constitution with assistance of their OB to show their growing willingness to improve themselves.

There are several major ways in which Haruna and his group have changed their maize farming practices, as a result of the access to the OB Aswaba Farms, which has provided training for his outgrowers, financing, and a market outlet for their harvest. This includes the use of tractor services where previously there was none. They have learnt how to apply crop protection inputs on their fields and crops with knapsack sprayers. They have learned to bury weeds for production of green manure instead of burning, and concentrate on practicing good agricultural practices to increase yields instead of focusing on farming large acreages. The farmers have also moved from broadcasting seed (throwing handfuls of seed into the soil) to more targeted, seeding-into-a-hole practices using drills and dibble tools - which, although requiring more labor (and thus more costly up-front), results in less fertilizer use in the end. Also, they now understand how to acquire new skills from participating in field demonstrations and have learned the use of rippers for conservation farming.

Previously, they engaged in mixed cropping but now concentrate on a maize as commercial farmers. They are earning more income from increased yields of two to six bags per acre from their fields. Across ADVANCE II's portfolio of farmer beneficiaries, adoption of improved farming practices has been consistently high, driven in large part by the outgrower business model: in FY2015, 98.8% (or 52,577) of ADVANCE's beneficiary farmers adopted one or more of the targeted improved farming practices, and in FY2014, the adoption rate was equally high, at over 96% (or 36,452 farmers). This contributed to average yield increases of roughly 163% for maize in particular, up from the baseline of 1.38 MT/ha during the 2013 agriculture season to 3.63 MT/ha in 2015, and corresponding average gross margin increases from \$283/ha to \$1,108/ha.

They were eager to change their practices once they realized that their incomes were improving from increased yields and that female members no longer depended on their husbands on account of increased incomes from farm operations. Further, they are able to pay school fees without effort. Due to increased incomes, there is more cordial relations with wives because they now contribute to family needs without depending on men.

Not all members of the community are group members. The community has 350 people, out of which 200 are group members. Many of the remaining 150 were former group members who defaulted in their repayments to Aswaba Farms and were suspended. Also community members outside the group actively copy farm activities of group members. Some are not trustworthy to repay credit but they still engage in group practices. Although they do not benefit from tractor services leading to late farming, they still get appreciable yields from copying new practices.

***“We are now commercial farmers who sell our produce to make money. We no longer produce crops to only feed ourselves,” said Haruna Alhassan.***

Their new wealth is evidenced by increased nutrition and conversion from thatch to aluminum roofing sheets on their houses. Off farm, they now have more resources and time to engage in other activities such as cattle rearing, trading, dressmaking, and photography. Also, many are upgrading from bicycles to motorbikes.

The prosperity and life's success are also showing on Haruna. He has two wives who are active group members and five children, the eldest of who is 12 years old. They all regularly attend the community primary school without fail as school fees is no longer a problem, as was the case in Haruna's youth when he was denied a formal education. His house is now one of the many in the community showing a new roof line of aluminum sheets from the old thatch. His new Combian motorbike purchased after the 2015 production season is parked in front of his compound. To crown his growing social and political standing, he was elected assemblyman for the community at the District Assembly elections held in Ghana in late 2015.

Haruna's story is but one example of the broader change in the cereals system of northern Ghana that ADVANCE II has facilitated. For more on the broader changes, read the ADVANCE II case study in the full report, *Case Studies on Facilitating Systemic Change in Feed the Future*.



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