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How Did Conservation Agriculture Go to Scale? A Case Study in Utilization-Focused Evaluation

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Background: The Foodgrains Bank has an established record working in agriculture and food security with resource-constrained, marginalized farmers in sub-Saharan Africa. The three outcome areas of the Scaling-Up Conservation Agriculture in East Africa (SUCA) program were the adoption of conservation agriculture systems, an enabling institutional environment, and the promotion of enabling policies. These program areas were expected to yield intermediate outcomes that, together, would lead to the ultimate outcome of improved food security and sustainable livelihoods for smallholder farming households in East Africa. This case study reports on the endline evaluation of the five-year program.

Purpose: To illustrate the overlap between utilization-focused evaluation (UFE) and collaborative approaches to evaluation (CAE). The case study profiles an agricultural intervention and explores how the evaluation design accommodated the systemic nature of the program.

Setting: Scaling-Up Conservation Agriculture in East Africa (SUCA) was a five-year program of the Canadian Foodgrains Bank implemented from 2015 to 2020 to expand the size and scope of Foodgrains Bank's work in conservation agriculture in East Africa. The program supported local partners with a target of 50,000 male and female farmers practicing a

minimum of two of three conservation agriculture principles, and of improving food security and sustainable livelihoods for 18,000 of these farmers' households across three countries.

Research Design: The Foodgrains Bank was directly involved in the evaluation design through the definition of evaluation uses and key evaluation questions. Eleven implementing partners in East Africa were involved in primary data collection and some initial analysis.

Data Collection and Analysis: A mixed-methods approach was used, combining quantitative, qualitative, and participatory / visual data collection tools. A robust, intersectional gender lens was applied to the data collection instruments in the form of gender-disaggregated data collection and gender-focused questions across most data collection instruments.

Findings: The collaborative process confirmed a sense of ownership by the primary evaluation users over the evaluation design. The evaluation design combined outcome and learning uses that took advantage of the implementing organizations' commitment to learning. The findings demonstrated the value of the program and inspired a framework called CA Plus that illustrates the multidisciplinary approach underlying the program's success.

Keywords: *conservation agriculture; agriculture innovation; East Africa; scale-up; scale-out; UFE; utilization-focused evaluation; collaborative evaluation; complex systems*

Introduction

Objectives

This paper provides a case study at the overlap between utilization-focused evaluation (UFE) and conservation agriculture (CA). It explores how a collaborative design allowed for a holistic understanding about the systemic nature of CA adoption. The findings provide lessons for the future design of agricultural and livelihoods programs and signal the value of introducing evaluative planning from the inception of such programs.

Organization

We first provide organizational and program background, with a succinct mention of agricultural challenges for smallholder farmers in East Africa. Next, we include an overview of literature related to conservation agriculture (CA), utilization-focused evaluation (UFE), emergence and complexity, collaborative approaches to evaluation (CAE), and case study methodology, as well as a review of the overlaps among these five thematic areas. The next section provides the evaluation case study (implementation of the evaluation). The final section provides a discussion with a summary of the significance and conclusions of this evaluation process. It also includes a reflection on the learning experience from the perspective of an evaluation manager.

Project and Sectoral Context

Canadian Foodgrains Bank (Winnipeg) is a partnership of 15 Canadian member churches and church-based agencies working to end hunger in developing countries. Although Foodgrains Bank works internationally, the majority of their agriculture and livelihoods programming is in sub-Saharan Africa. Foodgrains Bank members implement projects and programs through locally based partner organizations. Most locally based partners are civil society organizations that have good connections with the local community, other civil society and educational organizations, and the local government. These partners are critical to the success of programming, due to their deep knowledge of local contexts and experience in implementing agricultural and livelihoods initiatives.

The agricultural sector in East Africa faces combined challenges associated with climate

change: degraded land and increasingly unpredictable rainfall. This predicament is augmented by high rates of population growth that has contributed to decreased food security. The majority of crop production in Ethiopia, Kenya, and Tanzania is based on subsistence agriculture implemented by resource-poor smallholder farmers. Their farming system is characterized by limited application of inputs, distorted markets, deteriorating soils, and increasingly unpredictable weather patterns (Tesfaye et al., 2015; Titttonell et al., 2012). Conservation agriculture (CA) was promoted in the region starting in the late 1990s as a means to improve soil health and fertility, augment the capture of rainfall, and increase crop yields and farm profitability.

Foodgrains Bank members and partners have decades of experience working with resource-constrained, marginalized farmers, including promoting CA. (For example, the organization learned over time that typical methods of promoting CA, which relied on significant outside inputs and limited long-term follow-up, were largely ineffective). The organization's long experience and resulting knowledge informed the five-year regional program that was the subject of this evaluation. Key values and strategies that form the basis of the program include

- focusing on minimizing input subsidies and offering sustained support to farmers;
- working with lead farmers in a community while at the same time ensuring that program benefits are available to all as a strategy for wider-scale adoption;
- addressing the whole farm/food system, including attention to market constraints and opportunities, improving access to capital, strengthening links with agribusiness, and political advocacy;
- combining complementary good agricultural practices with CA;
- working with younger and more entrepreneurial farmers and especially women;
- engaging farmers in on-farm research and innovation as a means of contextualizing CA to the diverse agroecological and socioeconomic contexts across the region.

Scaling-Up Conservation Agriculture in East Africa (SUCA) was a program of Canadian Foodgrains Bank implemented from 2015 to 2020 to expand the size and scope of Foodgrains Bank's work in CA in East Africa. Global Affairs Canada (GAC) provided funding worth CAD 14 million for SUCA, and Foodgrains Bank contributed an additional CAD 4.67 million, bringing the total to 18.67 million. The Mennonite Central Committee

Canada, Tearfund Canada, and World Renew were the member organizations of Foodgrains Bank directly involved in the SUCA program; these members in turn engaged 11 partner organizations in select regions of Ethiopia, Kenya, and Tanzania. The program supported local partners with a target of 50,000 male and female farmers practicing conservation agriculture principles, and of building networks, strengthening civil society, and supporting and enhancing the policy environment to facilitate the sustained adoption of CA practices by smallholder farmers. The SUCA program was designed to take a context-specific, innovation approach to conservation agriculture adoption. The program left choices about which specific principles and other best fit practices to adopt up to farmers. Because of this, and although many farmers implemented all three conservation agriculture principles, the program chose to define successful adoption of conservation agriculture as adoption of at least two of the three CA principles as defined by the FAO (FAO, 2020).

The three outcome areas of the SUCA program were the adoption of CA systems; an enabling institutional environment; and the promotion of enabling policies. In the logic model, these program areas were expected to yield intermediate outcomes that, together, would lead to the ultimate outcome of improved food security and sustainable livelihoods for 18,000 smallholder farming households in East Africa.

Literature Review

This section provides an overview of conservation agriculture (CA), utilization-focused evaluation (UFE), emergence and complexity; collaborative approaches to evaluation (CAE), and case study methodology. This is followed by a review of the overlaps among these five thematic areas, which constitutes a conceptual and methodological framework.

Conservation Agriculture

The term conservation agriculture (CA) was coined in the late 1990s, just prior to the first World Congress on Conservation Agriculture, held in Madrid in 2001. There are variations in definitions, but generally CA is agreed to be based on three principles: (a) minimum mechanical soil disturbance (i.e., no tillage) through direct seed and/or fertilizer placement; (b) permanent organic soil cover (at least 30 percent) with crop residues and/or cover crops; and (c) species diversification through varied crop sequences and associations

involving at least three different crops (FAO, 2020). While CA in its strictest definition is deemed to be practiced only when all three principles are meticulously applied (Derpsch et al., 2014), most farmers practiced variations of the constitutive CA elements long before the term was coined (Giller et al., 2015, p. 1). In fact, the methods now described as CA are very similar to traditional methods of agriculture that were used across sub-Saharan Africa before European colonization (Arnon, 1972; Leakey, 1936; Page & Page, 1991). While there are important synergies that occur with the application of all three CA principles (Kassam et al., 2022), even partial adoption of the CA principles (particularly when they are applied together with other complementary agricultural practices) has been shown to have beneficial impacts for farmers (Mhlanga et al., 2021; Mutenje et al., 2019; Thierfelder et al., 2018).

CA has been promoted globally as a regenerative type of agriculture with the potential to conserve and enrich soils while also increasing productivity. Some authors have challenged the blanket approach to CA and advocated for promotional work to go beyond technology to include policy and complementary farmer support (Tittonell et al., 2012). There have also been critiques of CA (Giller et al., 2009; 2015) and, more recently, a study by Corbeels et al. (2020) concluded that while CA brought improvements to soils, the yield benefits were minor. These authors argued that CA should not be promoted as a silver-bullet technology for African smallholder farmers to address low productivity and food insecurity. The formulators of the SUCA program were well aware of these critiques; however, their experience suggested there remained some potential worth pursuing.

Foodgrains Bank's focus on conservation agriculture (CA) dates back to experience starting in Zimbabwe in 2003 and slowly expanding to other countries within Africa, and a collaborative learning tour in 2013 and 2014 across Sub-Saharan Africa to explore the status of CA on much of the continent. One early conclusion from that exploration was that the promotion of CA technology on its own was insufficient for adoption, and that additional dimensions were required, notably networking among organizations and work in the policy arena. (It should be noted that the work of others to integrate CA into policies started as early as 1998 with the establishment of the African Conservation Tillage Network, which has helped integrate CA into the agricultural policies of the New Partnership for Africa's Development (NEPAD), the African Union, and national-level governments). Around the same time, the notion of

“contested agronomy” emerged: it emphasized the importance of addressing the political and socioeconomic context; in other words, it called for moving beyond a solely agronomic focus (Sumberg & Thompson, 2012).

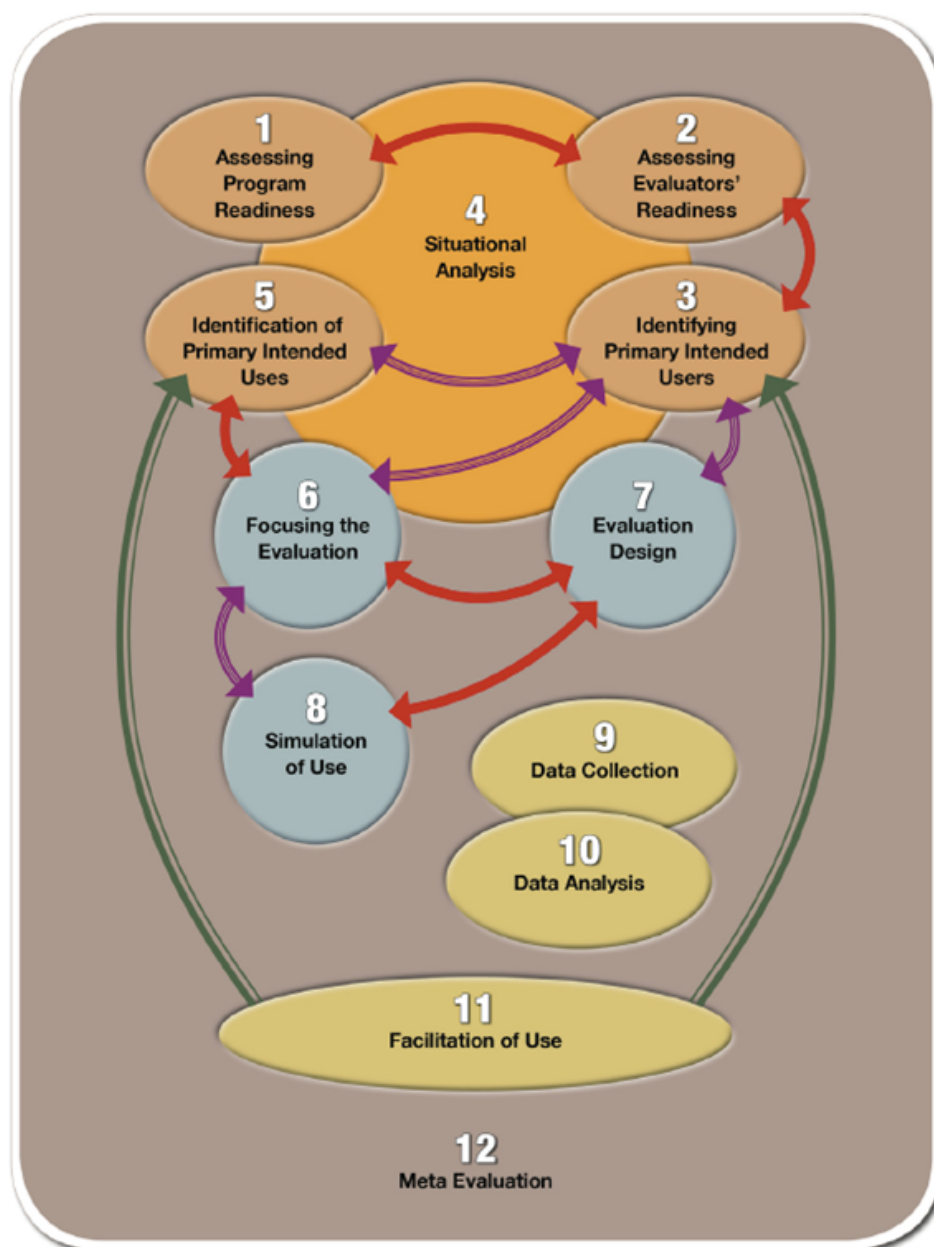
The SUCA program designers realized the importance of encouraging CA’s adaptation to different agroecological, social, and economic conditions. SUCA’s approach differentiated between promoting principles and locally adapted practices. This led them to educate farmers and field workers about the principles and invite local innovation and farmers’ informed decisions about the actual practices. This in turn led to the notion of “CA Plus,” which would combine good agronomic practices (namely improved seeds, precision in plant spacing, and enhanced soil health), promoted through timely extension (with an emphasis on farmer-to-farmer links) and combined with advocacy for enabling policies, marketing and storage opportunities, and private sector engagement. The emphasis on good agronomic practices is consistent with the notion of “complementary practices” (Thierfelder et al., 2018). This approach pointed toward the need to be adaptive to each location and to invite variations; the emphasis was on education for informed decision-making by farmers. The SUCA program promoted conservation agriculture principles and invited farmers to translate them into practices appropriate to their contexts. The extent to which adoption took place was determined based on both survey data and focus groups with farmers. The evaluation, however, did not delve into the details of the adoption process, as proposed by several authors who pose that the process is more complex than an on/off decision (Glover et al., 2016; Glover et al., 2019; Ronner et al., 2021).

Utilization-Focused Evaluation (UFE)

“UFE is a framework for enhancing the likelihood that evaluation findings will be used and lessons will be learnt from the evaluation process.” (Patton & Horton, 2009, p. 1) The central premise of utilization-focused evaluation (UFE) is that evaluations should be judged by their utility and actual use. In UFE, evaluators facilitate a learning process with attention to how real people in the real world apply evaluation findings and experiences. In designing a utilization-focused evaluation the attention is constantly on the intended use by intended users. UFE does not prescribe any specific content, method, or theory. It is essentially a decision-making framework, as opposed to a methodology. UFE can include a wide variety of evaluation methods. It is a process for learning and making decisions in consultation with those who can benefit from the evaluation. It is based on the fact that intended users will more likely utilize an evaluation in which they have ownership. Users can include beneficiaries, project managers, and funders (Brodhead & Ramírez, 2014).

The original UFE approach was developed by Michael Quinn Patton (2008). Figure 1 provides a snapshot of the approach. While UFE is summarized in a series of 12 steps, the process itself is not linear (Ramírez & Brodhead, 2013). The first five steps are interrelated: assessing program readiness; assessing evaluators’ readiness; identifying primary intended users (PIUs), and eliciting their primary intended uses; and situational analysis. This process may require several iterations of one or more steps, and it needs to be anticipated and planned for, given that changes in one step will impact others.

Figure 1. The steps in UFE (Ramírez & Brodhead, 2013)



Note. From *Utilization-focused evaluation: A primer for evaluators*. By R. Ramírez and D. Brodhead, 2013, Southbound.

Focusing the evaluation (Step 6) takes place through the definition of key evaluation questions that in turn guide the design of the evaluation. Simulation (Step 8, optional) is about test-driving plausible data sets to double-check that they respond to the questions. This step ensures course correction is possible, especially when it appears that some questions may no longer be as strategic

as they first appeared. A unique aspect of UFE is Step 11, facilitation of use, which ensures the findings and evaluation processes are fed back to the users. The closing step, 12, captures the experience through a metaevaluation; in other words, it's the reason for this article.

Emergence and Complexity

Evaluators often find themselves collaborating with projects that have uncertain outcomes. Some are research projects about new and emerging topics, while others involve multiple stakeholders who perceive issues and change strategies differently. In short, many such projects are not just complicated; they are complex (Barnes et al., 2003). Complex projects are those with limited or at best emerging certainty amongst stakeholders about how to address an issue, combined with limited or growing agreements amongst them on how to proceed (Bryson et al., 2011). In complex projects, cause-and-effect relationships are difficult or impossible to predict, although they can be documented once they have occurred. Complex or dynamic interventions need evaluation approaches that embrace uncertainty, which is not a matter of simply using conventional tools differently (Ling, 2012).

In complex settings, there needs to be clarity about what can be expected from an evaluation. Kuby (2003) argues that in today's international evaluation arena, one must move away from the false ideal of "scientific proof" and instead aim for plausibility. Plausibility is at the core of credibility, given the growing acknowledgment that development is difficult and complex (Kuby, 2003). The notion of contribution is also relevant in the impact research field, where research utilization is viewed as a complex, interactive process that is dependent on relationships (Douthwaite et al.,

2003; Morton, 2015). These voices are consistent with those who argue that the contradiction arising from political pressures to appear like "we are in control and that change is predictable" (Eyben, 2008, p. 44) in a world of uncertainty requires some response where multiple pathways for change are acknowledged (Eyben, 2013). Therefore, having a decision-making framework as part of a complex program evaluation design is important. Project teams must navigate and agree on what to evaluate, since the implementation may be emergent and constantly changing (Ramírez et al., 2019).

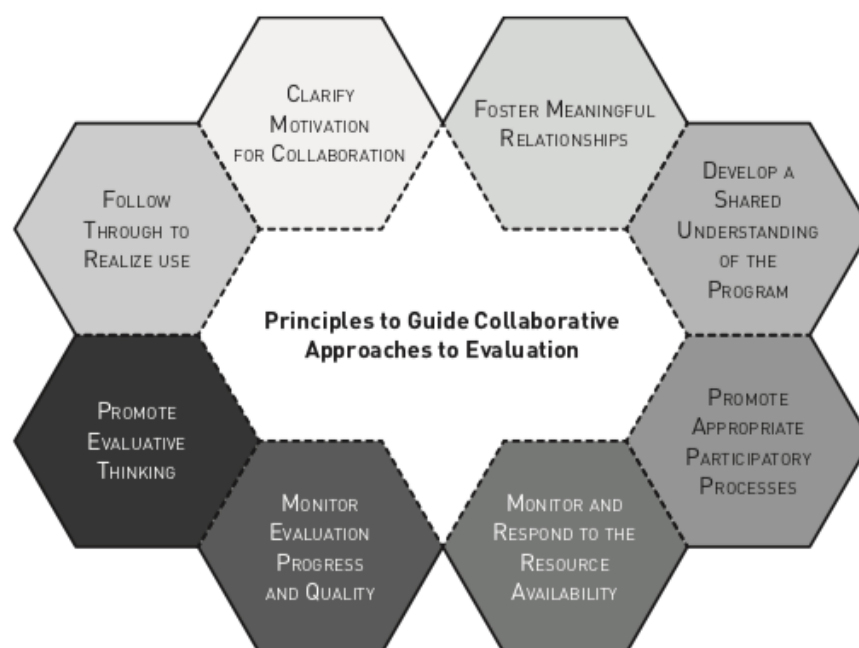
Collaborative Approaches to Evaluation

In addition to UFE as a decision-making approach, this evaluation followed the principles of collaborative approaches to evaluation (CAE):

CAE is a class of evaluation approaches where evaluators work together with members of the program community (stakeholders) to implement evaluations and produce evaluative knowledge about programs, projects, strategies, and/or other interventions. The CAE principles are premised on the understanding that context matters and that any CAE project should be collaboratively designed and developed based on stakeholder information needs and interests. (Cousins et al., 2015, p. 1)

Figure 2 summarizes the CAE principles.

Figure 2. Principles of CAE (Shulha et al., 2016: 194)



Note. From “Introducing evidence based principles to guide collaborative approaches to evaluation: Results of an empirical process,” by L. Shulha, E. Whitmore, J. B. Cousins, N. Gilbert, and H. Al Hudib, 2016, *American Journal of Evaluation*, 37(2), p. 194.

Case Study Methodology

Yin (2014) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon (the ‘case’) in depth and within its real-world context” (p. 16). Yin also adds that “case study research has a functional and legitimate role in doing evaluations” (p. 219). In her review of Yin’s book, Hollweck (2015) adds that in evaluation, case studies can be used to capture the complexity of a case, which can include temporal changes, as well as the contextual conditions of a case.

Yin presents three major applications for case studies in the context of evaluations:

- (3) As part of a larger evaluation with the case study portion viewed as complementary and providing explanatory information, (b) As the primary evaluation method where the initiative being evaluated becomes the main case, or (c) As part of a dual-level evaluation arrangement in which a single evaluation consists of one or more sub-evaluations with the potential of [the] case study playing various roles to inform the program evaluation as a whole. (Hollweck, 2015, p. 109)

This article provides a variation on the third application, where the case study serves as the

vehicle for the metaevaluation, as Step 12 in utilization-focused evaluation. Yin poses six elements of case study research: the plan, design, preparation, data collection, analysis, and reporting; all of these were part of the SUCA evaluation, as summarized in subsequent sections of this article.

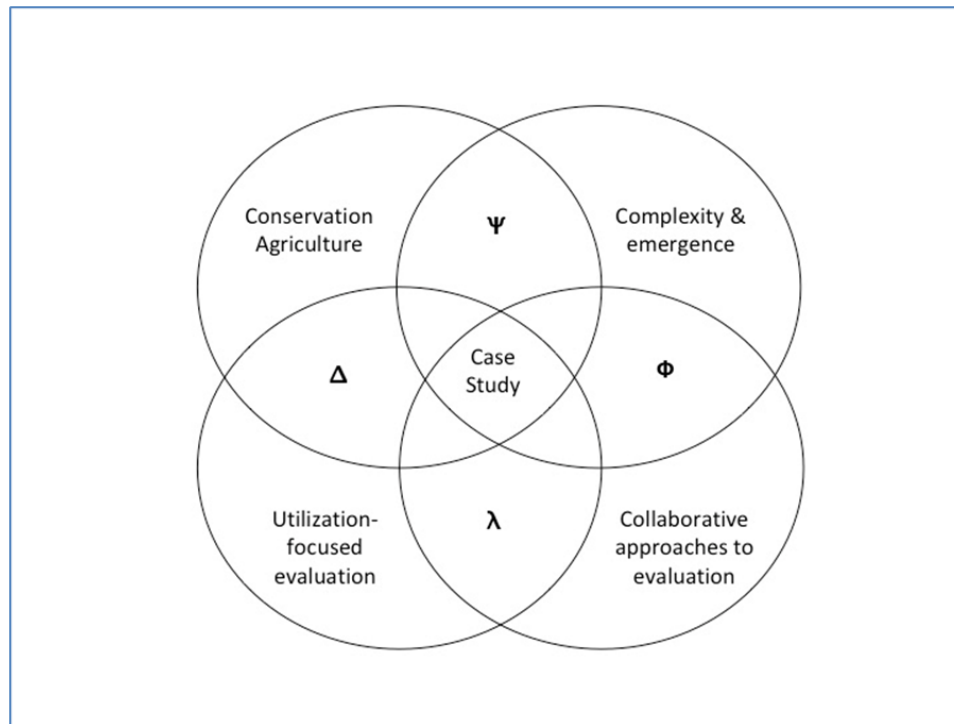
Conceptual and Methodological Framework

The above section provides succinct overviews of conservation agriculture (CA), utilization-focused evaluation (UFE), emergence and complexity, collaborative approaches to evaluation (CAE), and case study methodology. CA is the subject matter; UFE is the decision-making framework for the evaluation; complexity and emergence are properties of the SUCA program; CAE was central to the evaluation process; and case study methodology underlies the architecture of this paper. This paper, in turn, constitutes Step 12 of UFE: metaevaluation, as an opportunity to reflect on the process and outcomes of an evaluation.

As illustrated in Figure 3, this paper seeks to build on as many overlaps as possible among the four areas. In this section we emphasize the

overlapping areas, as illustrated by the Greek letters.

Figure 3. The Overlapping Dimensions of the Case Study



Utilization-focused evaluation has not been promoted as fundamentally participatory, but in our experience it lends itself rather well to collaborative practice. The theoretical overlap between UFE and CAE has been elaborated elsewhere (Ramírez et al, 2020). In practical terms, the engagement by the evaluators and Foodgrains Bank staff allowed the evaluation team to own the design of the utilization-focused evaluation. To a lesser extent, this was also possible for the East African partners who attended a February 2020 workshop in Nairobi. The following summarizes the CAE principles and how they were combined with the steps of UFE.

Utilization-Focused Evaluation + Collaborative Approaches to Evaluation (λ)

The principles of CA summarized in Figure 2 were applied in the following manner:

Foster meaningful relationships. The lead evaluator was able to visit Canadian Foodgrains Bank offices in Winnipeg. Later, together with the second evaluator (contributing to both gender

dimensions and quantitative methodology), they were able to join an all-partner gathering in Nairobi in February 2020. These exchanges allowed them to establish relationships and begin to earn the trust of the SUCA network.

Develop a shared understanding of the program. Central to the Nairobi workshop agenda was the presentation of a draft evaluation design. The evaluators participated in all other events during the gathering; this allowed them to become more familiar with the program.

Promote appropriate participatory processes. The close involvement of the evaluation team [its composition is described below] in the definition of evaluation uses and key evaluation questions constituted a means of gaining some understanding about the program and participating in deciding how to evaluate it. This covered Steps 5 through 7 of UFE.

Monitor and respond to resource availability. Estimating the level of effort and cost of an evaluation of this complexity and scale is difficult. The work was split into separate components:

design, implementation, and reporting, followed by an additional contract to modify the report for the funder. This staged approach allowed Foodgrains Bank to manage the resources and approximate the level of effort by the evaluators and the data collection efforts by the partners.

Monitor evaluation progress and quality. The staged approach described above also allowed for monitoring of progress and quality. The main evaluation report included reference to how the evaluation has adhered to the standards of the Canadian Evaluation Society (Utility, Feasibility, Propriety, Accuracy, and Accountability). In addition, the methodology addressed the scope and limitations of the evaluation.

Promote evaluative thinking. It was fortunate that the team was already quite familiar with evaluative thinking. The close involvement of the evaluation team in the design of the evaluation, combined with regular interactions with the evaluation team, further enhanced evaluative thinking.

Follow through to realize use. This step is part of UFE Step 11. Not only did the evaluation team work closely in reviewing the draft report; additional staff members at Foodgrains Bank were closely involved in combing through the findings and working with the evaluators to produce a shortened report for the funder. Beyond that, the evaluation team commissioned further reports to examine the findings across several different topics.

Complexity & Emergence + Collaborative Approaches to Evaluation (Φ)

The SUCA program exhibited several characteristics that are typical of complex systems. The following summary is based on propositions about complex systems and their evaluation as proposed by Preskill et al. (2014).

Complex systems are always changing, often in unpredictable ways. The evaluation design included questions to track unexpected outcomes, as well as changes in organizational relationships.

Many parts are connected; one part of the system affects the others. Attention was placed on understanding the interrelationships among the three SUCA outcome areas: CA scale-up, enabling institutional environment, and policy change. Introducing the notion of CA Plus was an attempt to illustrate the systemic interactions among the components of the program.

Information drives learning and helps the system thrive. The evaluation documented the learning capacity of the system with attention to feedback loops and interconnections at local, district, national, and regional levels.

Context matters. The evaluation acknowledged the baseline assessments completed by the SUCA program and the country-specific contexts (for example the devolution of agricultural policy and administration in Kenya and Tanzania), as well as the location-specific situation assessments done at each of the individual project sites.

Best principles are more relevant than best practices because each situation is unique. The focus on promoting principles -as opposed to practice- was present in the SUCA approach. The evaluation sought to document the combination of factors that enabled the SUCA program to reach its targets, with attention to which principles could be adapted to other regions or programs in future.

There will be different levels of energy and convergence over time. The SUCA program had many moving parts, and their convergence was most evident during the recent past. For instance, it took time for policy advocacy activities to yield outcomes that, in turn, would shape the institutional enabling environment and lead to consolidation of CA among different government departments.

Relationships between and among partners are as important as the partners themselves. Prior to the SUCA program it was reported that partners worked in isolation from each other and from other stakeholders working in agriculture and food security. The evaluation sought to document changes in partner organizations' approach and capacity in regards to collaboration and networking.

Cause-and-effect relationships are neither linear nor predicable; iteration is more common. The evaluation focused attention on the complex connections between CA adoption, marketing, household decision-making, gender, nutrition, and food security. This included a literature review on these relationships.

Patterns can emerge from the different and mainly independent organizations which are part of the program. The evaluation paid attention to inter-organizational dynamics at various levels. This included a review of the SUCA program organizational configuration, as well as the linkages

among organizations as experienced by farm households.

Complexity & Emergence + Conservation Agriculture (Ψ)

The conventional design of agricultural innovation has assumed that change follows a linear causality with predictable changes, as proposed in early theories about the adoption of innovations (Rogers, 1995). The model was based on a pipeline-style approach to change with "...a causal chain of inputs, processes and outcomes that lead to impact" (Douthwaite & Hoffecker, 2017, p. 89). As mentioned before, the SUCA program departed from this notion from the beginning by focusing on three interrelated outcome areas: adoption of CA, an enabling institutional environment, and policy change. Measuring change in any one of these outcome areas is challenging, but when combined, it is especially complex.

For instance, the connections between advocacy efforts, initial outcomes, and actual changes are not easily established; they are elusive and often indirect. Oftentimes they are the result of intangible processes that cannot be traced. Verifying advocacy outcomes is both unique and problematic (Arensman, 2020).

In contrast with conventional agricultural innovation approaches, the SUCA program sought to engage farmers in the development of innovations, not as passive recipients of practice developed by experts. For Douthwaite et al. (2003), this meant the design of such a program was committed to social construction: where the understanding of new phenomena is undertaken as a group through learning, adaptation, and negotiation.

While positivists see farmers as being essentially passive recipients of extension messages, constructivists see the role of an extension worker much more as a facilitator fostering a "social construction" process. This "social construction" involves farmers experimenting with the new technology in the process of making sense of it and adapting it to their own socio-economic, cultural, and agro-ecological conditions. Hence, constructivists see research continuing well into the extension phase, and this has important implications for the monitoring and evaluation of research. (Douthwaite et al., 2003, p. 245)

The approach is consistent with the FAO-Farmer Field School (FFS) concept (FAO, 2015), which became an integral part of CA promotion. After having been developed for integrated pest

management (IPM) programs as a common learning platform rather than a training and extension approach, the FFS concept fulfilled the same need for CA, as CA principles also had to be adapted to local practices, which is best done by farmers.

Conservation Agriculture + Utilization-Focused Evaluation (Δ)

The fields of agricultural development and evaluation have undergone comparable shifts in recent decades. Both have moved from grand positivist theories to more grounded, contextualized, and multidisciplinary perspectives (Douthwaite et al., 2003; Douthwaite & Hoffecker, 2017; Lincoln et al., 2003; Patton & Horton, 2009). Lincoln and co-authors suggest that the new context invites more naturalistic and pluralistic approaches. They emphasize the importance of narrative, as stories' recursiveness helps compensate for logic models that are mostly linear. Very much in line with these notions, the SUCA evaluation integrated qualitative and participatory data collection tools to contextualize the quantitative data.

There are a few examples of UFEs in agriculture. Patton & Horton (2009) summarize the case of the Papa Andina project in Peru. Another UFE exercise that covered an agricultural research program in several parts of Guatemala is worth mentioning. The process engaged a wide number of primary evaluation users in defining the uses and key evaluation questions. Upon the completion of the report, the evaluation included a detailed workshop whereby the users were able to not only review the recommendations but also engage in the design of a theory of change for the remainder of the project. The latter event was an example of how the facilitation of use, Step 11 of UFE, can be designed (Navas, 2018).

The evaluation of the SUCA program included an evaluation team made up of Foodgrains Bank staff who worked very closely with the evaluators throughout the process. "UFE is highly personal and situational. The evaluator develops a working relationship with intended users and helps them determine what kind of evaluation they need" (Patton & Horton, 2009, p. 1). These authors add that research on use has confirmed that

intended users are more likely to use evaluations if they understand and feel ownership of the evaluation process and findings; they are more likely to understand and feel ownership if they've been actively involved; and by actively involving primary

intended users, the evaluator is preparing the groundwork for use. (Patton & Horton, 2009, p. 1)

Patton and Horton refer to a negotiated process between primary users and evaluators to define evaluation uses. They refer to the interactions as a combination of active, reactive, interactive, and adaptive moments. This was very much the case in the SUCA evaluation design stage where, among other things, the evaluators identified existing internal studies and reports that reflected unexpressed evaluation uses; these were then included in the overall evaluation design. This interaction continued during other steps of the evaluation, such as in agreeing on a theory of change to summarize the policy work, and in the design of the final CA Plus diagram.

Evaluation Case Study

Implementation of the Evaluation

The endline evaluation of the (SUCA) program took place from January to December 2020. The evaluation approach was based on utilization-focused evaluation (UFE) as a decision-making framework. The primary evaluation users (the evaluation team) comprised a team of four Foodgrains Bank staff, two based in Winnipeg and two in Nairobi. They were engaged in reviewing draft evaluation use statements, and possible key evaluation questions (KEQs) over several iterations. A draft evaluation design was presented at an all-partners meeting in Nairobi in February to validate the design and gather suggestions for implementation.

The final design included four evaluation uses and 16 associated key evaluation questions (KEQs). The four uses were complementary (program design, impact, organizational structure, and scale-up methodologies) and addressed the three SUCA program outcome areas.

Use I: to improve design and strategy for future projects.

1. To what extent did the three program outcome areas improve CA, food security, and sustainable livelihoods for male and female farmers?
2. In what ways did the project-impact pathway compare with the theoretical and practical literature about the linkages between improved yields / income and food security and sustainable livelihoods for male and female farmers?

3. In what ways did the different program delivery and adaptations lead to unexpected outcomes (positive and negative) for male and female farmers?

Use II: to verify outcomes for accountability across three program outcomes.

4. To what extent did the SUCA program successfully scale out conservation agriculture in terms of the number of male and female smallholder farmers practicing CA / the amount of land and diversity of crops under CA?
5. To what extent did the SUCA program create a supportive enabling institutional environment at the local to national levels to scale up CA among male and female farmers?
6. How did CA system adoption impact gender equality?
7. What are the environmental / farming system impacts from CA adoption in terms of soil health and crop yields?
8. What are the socioeconomic impacts of CA system adoption on participant male and female farmers' income and net assets?
9. To what extent did the SUCA program successfully scale deep conservation agriculture? ("Scale-deep" refers to internal knowledge and attitudinal changes by farmers.)
10. What are the impacts of the SUCA program on food security for women, men, girls, and boys in households?
11. To what extent and where did policy impact scale-up occur, and how did it come about? ("Scale-up" refers to widespread changes enabled by policies and programs.)

Use III: to improve future organizational configurations and organizational strengthening strategies.

12. To what extent did the program decision-making and management approach work as expected?
13. To what extent and in what ways did the program organizational configuration affect the networking capacity of the participating organizations?
14. To what extent were the participating organizations able to address gender needs and differences in project implementation and monitoring?

Use IV: to analyze and share the different extension methodologies for scale-up purposes.

15. To what extent and in what ways did the different extension approaches contribute to the outcomes?
16. To what extent are the different extension approaches transferable to the public extension systems in each country?

Methodology and Data Analysis

A mixed-methods approach was used, combining quantitative, qualitative, and participatory / visual data collection tools. A robust gender lens was applied to the data collection instruments in the form of gender-disaggregated data collection and gender-focused questions across most data collection instruments. Three gender-disaggregated population groups were formed for focus group discussions (FGDs) and household surveys: men in male-headed households (men in MHHs), women in male-headed households (women in MHHs), and female heads (FHs).¹ The following data collection tools were applied:

- A statistically representative survey conducted at the farm household level in all three countries with a 95% confidence level and 10% margin of error led to a sample size of 1,989 households (567 in Ethiopia, 895 in Kenya, and 527 in Tanzania).
- Focus group discussions covering five different topics: CA practices and food security; gender differences and changes; community-level groups and gendered access to resources; marketing outcomes; rich picture comparisons; youth and CA dropouts). The number of individuals who participated in focus groups totaled 2,798 (62.5% women; 37.5% men).
- Key informant interviews were carried out separately with representatives of government, the private sector, and research and academia.
- Participatory data collection tools included linkage maps; timeline and force-field analysis; and, as part of the FGDs on CA practices and food security, seasonal calendars.
- Partners' gender capacity questionnaire.
- Questionnaire and interviews on organizational performance.

The evaluation built on preexisting reflection exercises by Foodgrains Bank, including the midterm reflection, a 2017 Theory of Change update, two internal reports, reports by Farm Radio International and a University of Manitoba soils

study (Entz et al., 2022), and the presentations made by partners and consultants during the February 2020 meeting in Nairobi. In addition, a number of reports were commissioned to support the evaluation. The topics included the agricultural extension methodology, a marketing study in Ethiopia, gross margin analysis and yields, three program policy reports by country, and one policy outcomes summary report.

The external evaluators were able to participate in the full February 2020 workshop in Kenya in preparation for the evaluation. This allowed them to become familiar with many of the member and partner staff and get a sense of the SUCA program. However, beyond that meeting the external evaluators were not present on the ground; due to COVID-19 restrictions, they were not able to visit the field to meet farmers, witness the CA practices, or meet with the various stakeholders involved at the field level. Partner staff and hired enumerators were responsible for data collection. The COVID-19 pandemic caused travel restrictions that affected the data collection efforts in a substantial way. A significant effort was made for continuous engagement with the evaluation team in Winnipeg and Kenya to respond to logistical challenges. Such additional efforts in coordination have since been recommended for future evaluation work under pandemic restrictions (Oti et al., 2020).

Data analysis took several variations. The quantitative data was collected using tablets and an online platform; an IT specialist in Nairobi produced initial dashboard summaries that were further analyzed by one of the evaluators. The partners were guided in developing initial quantitative data analysis for responses covering their own project areas. The partners also completed an initial round of qualitative data summaries following a detailed guide developed by the consultants. The remaining analysis and report writing were completed by the evaluation consultants, who were also responsible for the main evaluation report. The consultants, with assistance from the evaluation team, produced a summary version of the main report for Global Affairs Canada as the main external audience of the evaluation.

The evaluation team and the evaluation consultants met on a regular basis throughout the evaluation. The process allowed for the attributes described above (see sections λ and Φ) in terms of an ongoing adjustment of the implementation process, especially in light of COVID-19 restrictions

¹ We included both de jure and de facto female heads. De jure female heads are women who are divorced, widowed, or never married. De facto female heads are women who may be married or have an adult male

partner, but whose male partner/spouse is away from the household or does not contribute socially or economically to the household. See FAO term portal: <http://www.fao.org/faoterm/en/>.

for data collection. During these exchanges, the evaluators were also able to share emerging findings and engage the primary users in sense-making and interpretation. This process responded well to the principles of collaborative evaluation mentioned above.

Findings – Content

The evaluation confirmed that CA had been welcomed with enthusiasm among farmers, the private sector, researchers, and policy makers in all three countries. In some cases it had been seen as a life changer and a means of survival for households. The total number of farmers trained and practicing at least two CA principles by September 2020 was 54,376 surpassing the original target of 50,000 with a gender balance of 50% (Ethiopia 28,244; Kenya 18,126; Tanzania 8,006). It is worth adding that the notion that using at least two CA principles constitutes CA adoption was an internal determination within the SUCA program. The three program outcome areas combined forces to improve CA, food security, and sustainable livelihoods for male and female farmers.

The perceived benefits of CA were a combination of better and more stable yields (especially in dry years); improved soil health and moisture retention; reduced weed pressure and reduced soil preparation, leading to time savings; increased crop and income diversity; improved storage, leading to higher prices; significant increases in gross margins; increased empowerment of women; better nutrition; more engagement with youth; and improved harmony in households. Male and female farmers who adopted CA practices became role models. There were changes in self-perceptions, as well as changes in family dynamics and greater peace in households, with increased teamwork and collaboration among women and men. Women were now seen as knowledgeable or learned, and children were appreciating their mothers' contributions to household welfare. Men were more prone to stay at home, as there was enough to eat. There were remaining challenges going forward with CA: lack of mechanization; small sizes of plots; livestock competition; limited access to equipment and inputs; and new incidence of pests.

A predominant impact pathway was the adoption of CA that was enabled by the institutional environment. Subsequently, as the benefits of CA became evident, they began to appear in supportive policy narratives, thereby providing further validation: a tipping of the scales, so to speak. The findings showed that women integrated nutritional

factors in their crop planning, which was enhanced by the third CA principle of increased crop diversification. It follows that women's enhanced participation in decision-making played an important contributing role in food security. This combination of enabling factors is encompassed in the CA Plus framework (more on this in Figure 4). The evaluation did not explore adoption behaviour in detail, nor was it possible to carry out a contribution analysis (as proposed by Ton & Glover, 2019; also Mayne, 2001) to confirm the extent of the project's influence.

All three gender groups in Ethiopia, Kenya, and Tanzania spoke about CA changing the gender division of labor, and an increased sharing of domestic and agricultural workloads. Across all countries, women gained more decision-making power under CA, with variations by gender groups. However, gender power differences are difficult to shift: fewer women were leaders of community groups or vocal in groups compared to men, and some women do not volunteer to be leaders due to their illiteracy. Positively, female farmers in Kenya said that they now felt freer to speak up at community meetings, and more empowered because of their ability to provide for their households. Men in Kenya also said that they were no longer fearful of their wives' empowerment. Challenges remain: some women in Kenya required their husbands' permission in order to attend CA training sessions, and others said that they were unaware of CA training sessions being held. Overall, women had less access to extension workers and to agricultural information.

Men and women expressed appreciation at CA's performance in increasing household incomes and assets. CA had a particularly significant impact on female heads and women in male-headed households by enabling them to provide adequate food for their households, and to pay for critical household needs, including school fees. CA meant a reduction in the costs of carrying out agriculture, as well as a reduction in time and labor inputs. With the increased income, all three gender groups were now able to invest in the purchase of productive assets as well as to meet household needs.

This evaluation found evidence about how much of the pluralist extension approach, and the efforts to bring together stakeholders who normally work in silos, were the result of efforts led by SUCA partners and consultants, especially on the policy side. The training proved effective in awakening the notion of farming as a business. Both female and male farmers reported new skills and practices. In all partners' reports, farmers confirmed positive gains by using PICS bags for storage (Purdue Improved Crop Storage), and by selling in bulk and

selling at a later date. A gross margin analysis (GMA) study showed that average nominal increases in profits per acre were significant (US\$430 for Ethiopia, \$449 for Tanzania, and \$204 for Kenya), and so were the percentage changes (243% for Ethiopia, 288% for Tanzania, and 1,740% for Kenya).

Men and women in all three countries spoke about some social benefits of improved household food security. Households with an acceptable food consumption score (FCS) included 98% of respondents in Ethiopia, 92% of respondents in Kenya, and 84% of respondents in Tanzania. Respondents from the three countries ranked food security / having enough food for home consumption in the top three for benefits of CA. While 49% of respondents in Ethiopia, 46% of respondents in Kenya, and 34% of respondents in Tanzania felt “food secure,” this perception was significantly lower for female heads in all three countries. Higher CA crop yields have contributed to a reduction in the use of the harmful gender practices of men and boys eating first in Ethiopia. When food was scarcer, women and girls ate last, which meant that they were often malnourished. Also, women’s ability to decide which CA crops to grow contributed to improved household food security and nutrition, as women generally grew a wider variety of CA food and cover crops in all three countries.

The policy review included examples of significant changes to policy regimes: Ethiopia’s Ministry of Agriculture’s (MoA) development of a national program to implement CA; a directive issued in 2018 to include CA in the extension package and to promote it in several regions of the country; the MoA providing CA implementation guidelines to guide experts in all regions; etc. Also relevant are instances in Tanzania where the MoA is developing a new agriculture policy to include CA and to allocate funding, and Kenya’s Egerton University’s development of a short course on CA.

SUCA was more than the implementation of an innovative program: it was also a policy experiment with lessons that were to be translated and made meaningful to different CA stakeholders. In the original SUCA program the notion of CA Plus was associated with the integration of the CA principles with other beneficial agricultural practices, such as agro-forestry, livestock integration, and irrigation where conditions allowed it. The evaluation has found that CA Plus has become understood more broadly. It included additional dimensions that built on the other program outcome areas and beyond. Figure 4 provides a summary of CA Plus as the final SUCA program framework.

Figure 4. CA Plus as the final SUCA Program Framework

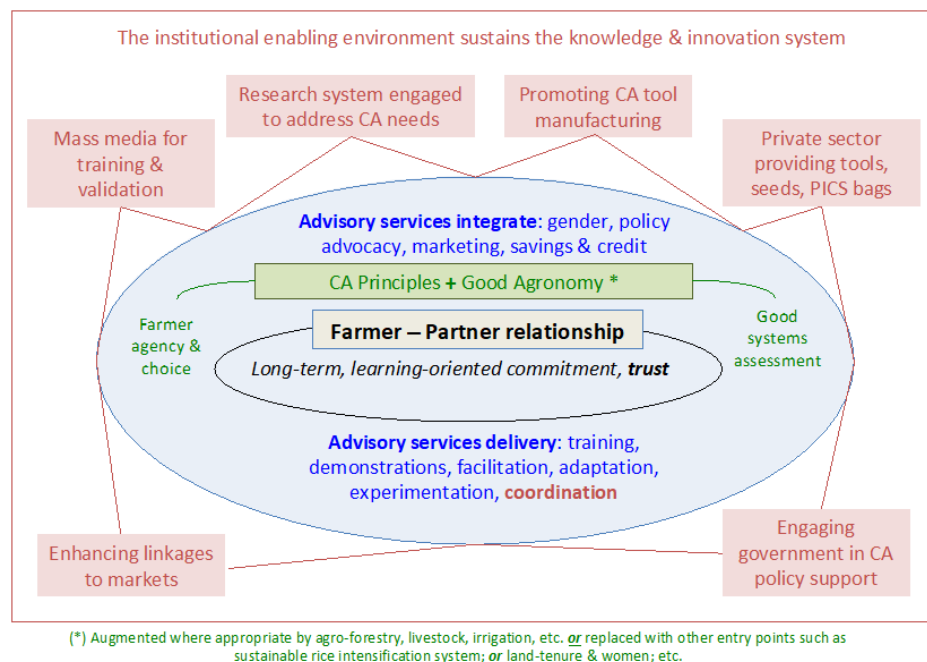


Figure 4 shows the CA principles combined with good agronomic practices (especially improved soil fertility) as the starting point. The core of the program was supported by multifaceted, farmer-led advisory services. This in turn was supported by strategies to address structural problems in the farming sector. However, Figure 4 does not cover all dimensions of the approach; illustrating a complex dynamic system will require further diagrams. Moreover, it is expected that the process will continue evolving. CA Plus is not what made the SUCA program work. Rather, it was the underlying systems approach for the adoption and scaling of conservation agriculture. Going forward, such a system will need to be adapted to other technologies, policy contexts, and agronomic requirements.

Findings – Process

UFE emphasizes using both an evaluation's findings and its process. The latter invites a phase of reflection and looking back, one that is often aided by the preparation of a metaevaluation (Step 12 of UFE).

During the regular meetings between the evaluators and the primary users, new insights began to emerge. What the team reflected on was the lack of a broader evaluation design that could address dimensions not covered by the program measurement framework (PMF), which in fact had begun to be addressed through internal reporting that did not have a dedicated evaluation purpose. One early example took place when the evaluators suggested that some evaluation uses could incorporate earlier internal studies that had been commissioned, as they constituted developmental evaluation instances. This suggestion awoke a realization among Foodgrains Bank staff that there was an underlying evaluative culture within both the organization and the SUCA program that deserved to come to the surface. Soon after this, the evaluation team began sharing thoughts about the value of incorporating more evaluation planning from the start of the program. While much of this evaluative thinking was already present, it was mainly focused on tracking the indicators that were collected according to the PMF.

Other process-related findings emerged through the interaction among the evaluators, the evaluation team, and several other Foodgrains Bank staff. One instance centered on the development of the policy reports for each country. This process included the review and fine-tuning of

a summary theory of change. One of the evaluators, one staff member, and a consultant who led the advocacy work in East Africa collaborated in the review and finalization of the diagram. This was an example of a collaborative approach to evaluation; specifically, the principles of developing a shared understanding of the program. A similar process took place with regards to the development of the SUCA program's CA Plus framework (Figure 4). Once again, one evaluator and several Foodgrains Bank staff from Winnipeg and East Africa reviewed and adjusted the content and layout until they arrived at a diagram that captured the rich and systemic interactions that explained why the program had been successful. From a systems point of view, the CA Plus framework emerged from the evidence to show how the different outcome areas had combined forces in ways that would have been difficult to determine at the start of the program.

It is noteworthy that during the regular exchanges between the evaluators and the evaluation team, the latter suggested the need to tell the story about the evaluation process. The "aha moment" was important. It signaled a heightened understanding about the process even before the process yielded results. That aha expression was the seed that eventually germinated into the preparation of this paper.

Before closing this case study section, a word on the evaluation recommendations is important. For the sake of brevity the recommendations are not included here. However, the process by which they were reviewed and validated by the primary evaluation users matters. In UFE, Step 11 refers to the facilitation of use of both the findings and the process, yet the mechanisms to do this are not prescribed. This allows the evaluators the space to be creative and find ways to engage the primary users in the analysis. One mechanism that has been used in the past is to organize an event where the primary users are invited to review the report and to comment on the draft recommendations (Navas, 2018). The opposite has also been reported, where the primary evaluation users take the lead in drafting the recommendations and the evaluators comment on them (Ramírez et al., 2015). Either way, the review and priority-setting of recommendations is a venue to engage the primary intended users (PIUs) in the analysis and, more importantly, in ensuring that the content and process findings are put to work. One way this took place at the end of the SUCA program evaluation was the preparation of a shortened evaluation report for the funder; the consultants worked very closely with Foodgrains Bank staff on the report.

The original validation process could not be completed, due to COVID-19 pandemic restrictions. The SUCA team had originally planned to host an in-country final workshop in each of the three program countries, to share the final results of the program with local, regional, and international stakeholders; celebrate the program's success; and also present and validate evaluation findings. These workshops were intended, in part, to provide a forum for validation of the evaluation findings and also to provide space for discussion of the recommendations and how these recommendations could be taken forward or enacted by local partners. However, due to COVID-19 these workshops were significantly scaled back and were reduced to local gatherings. On the one hand, they still provided a forum for local partners to share their results and experiences in the SUCA program with their network of local stakeholders and government; however, on the other hand, regional and international participation was limited. Thus it was a challenge for the evaluation team to validate the evaluation findings with the local partner organizations and find an effective way to disseminate results.

The evaluation users also recognized that an intentional learning process needs to be designed and delivered to disseminate and digest the evaluation report and program learning through the Foodgrains Bank network. At the time of writing, the evaluation team was still in the early stages of this process. But one way this is taking place already is that the Foodgrains Bank staff who were on the evaluation team are working to integrate a formal learning and evaluation process into a new 18-month CAD 10 million program (eight members and partners in six countries) delivering humanitarian and early recovery development activities to address increased food insecurity caused by the COVID-19 pandemic in sub-Saharan Africa.

Discussion

The above case study on the SUCA program evaluation illustrates how UFE can be applied to a conservation agriculture evaluation. The conceptual and methodological framework underlines how a collaborative design allowed for a holistic understanding about the systemic nature of CA adoption. The content and process evaluation findings provided lessons for the future design of agricultural and livelihoods programs.

An important feature of this evaluation was the multiplicity of studies -existing ones and those commissioned during the evaluation- and the

various data-collection instruments that shone light on different aspects of the SUCA program. This is reminiscent of Gareth Morgan's notion that multiple images or metaphors are needed to understand an organization (1997). In his analysis, a single metaphor can make invisible other dimensions of an organization. SUCA has three interrelated outcome areas (adoption of CA; institutional coordination; policy advocacy); each can be seen as entry point to understand the program, and yet the overall program's value was best summarized in the CA Plus framework. However, each outcome area on its own is insufficient to fully describe the program. This in turn makes the communication of the findings challenging, as so many components deserve mention.

The evaluation further confirmed the importance of gender, of training in marketing, of linkages between NGOs and government, of training farmers about CA principles and inviting them to adapt local practices, and of the energy that arose from a sense of belonging among the 11 implementing partners. While the project management framework focused on tracking outcome indicators, the rest of the evaluation sought to appreciate what made this complex process tick.

Complexity-aware programs are particularly disadvantaged by the adoption impact pathway narrative because they are not attempting to manage towards predictable outcomes within existing innovation trajectories, but rather to provoke and then harness beneficial system interactions and dynamics (Arkesteijn et al., 2015; Douthwaite et al., 2003; Ton et al., 2014) in the process of catalyzing and supporting new ones. These programs therefore cannot easily forecast their impacts *ex ante* and may also produce unexpected impacts which are not included in the adoption impact pathway and which can therefore remain invisible to evaluators, donors, and organizational decision-makers. Complexity-aware programs, therefore, face challenges in communicating their impact to donors, particularly in the absence of causal models that more accurately describe how these programs work and what results they produce. Douthwaite & Hoffecker, 2017, p. 90)

The above quotation speaks to the wider challenge of project and program design and evaluation. Many funders have insisted and continue to insist on logical frameworks that, by definition, imply a linear causality of change. This was the case with the SUCA program's PMF; however, in this case the implied linear approach was complemented by multiple other studies that

Foodgrains Bank had commissioned prior to the start of the evaluation and as part of it. The CA Plus framework crystalized the systemic and complex nature of the program and may become a tool to communicate its interrelated parts. At a theoretical level, this paper has emphasized the overlapping dimensions shown in Figure 3, where the coming together of different concepts provided the spaces for innovation. Future efforts of action-learning in evaluation practice may benefit from such experimentation.

Reflections from the Evaluation Manager

The SUCA program has been an exercise in innovation and experimentation, and the evaluation process was no exception to this trend. The international development landscape carries the remains of far too many unsuccessful programs; it is much less often that a program delivers achievements on multiple levels beyond what was originally envisioned. Although this program's first two years started with the usual ups and downs of an agricultural development program, something significant started to shift at the time of the midterm reflection. The program team developed a participatory midterm reflection process that included hiring an external consultant to lead the process and a second team to lead on electronic data collection for a multisite household survey. Although this was very time- and labor-intensive, partner staff were involved in the data collection and focus group discussions, but teams were assigned to collect data from another partner and not their own project. This partner exchange became a deep learning opportunity and created a great sense of shared ownership and collaboration among the various project staff. Following a multiday debrief workshop, where partner, member, and program staff extensively engaged with the midterm reflection findings, conclusions, and recommendations, partner staff were motivated to better understand why yield improvements from the practice of conservation agriculture were not directly translating into improved household food security and what barriers and constraints there were to women farmers in the program.

This, among other learning activities both within individual projects and across the program as a whole, led to significant interest in the final evaluation. Partner staff no longer saw evaluation as an external process to be done to them, as can so often be the case in agricultural development projects. Rather, they viewed evaluation as a learning opportunity and were very enthusiastic to

engage. Twenty months before the end of the program, the evaluation manager initiated a discussion process to start gathering potential evaluation themes and questions. This led to the formation of three groups of members, partners, and Foodgrains Bank staff, each focusing on developing further one research theme: (a) extension approaches and innovation, (b) organizational change, and (c) impacts on household food security and gender. The first group developed a set of tools for partners to use to gather information on individual project approaches to extension and document farmer-led innovation experiences. These were presented at the February 2020 gathering in Nairobi and formed the basis for a secondary analysis in the evaluation process. A second group developed an internal survey process to document the experience of organizational change for partners, members, and Foodgrains Bank staff emerging from the unique-to-Foodgrains-Bank organizational and management structure used in the program. This analysis also formed a data set in the program evaluation. The third group's theme and questions formed the basis of the original terms of reference for this program evaluation.

As noted previously, the COVID-19 pandemic presented significant challenges to the fieldwork portion of the evaluation. It turned out to be extremely fortuitous that a participatory approach to data collection was envisioned in the evaluation design, as local partners were able to collect data in person while adhering to all appropriate local public health regulations. The commitment of local partners to ensure that the story of their five years of effort could be told through a rigorous evaluation process meant that significant effort was put into ensuring a good data collection process, despite extremely stressful pandemic realities.

The most significant impact of the pandemic on the evaluation process was on the validation and final dissemination stage, which we had planned to conduct in person through in-country workshops. Absent this vehicle, this remains a challenge for the Foodgrains Bank evaluation team. However, it is hoped that the commitment to learning that has been developed through this program will translate into this final step. Certainly, one of the lasting impacts of this evaluation process will be the more explicit integration of UFE approaches to evaluation across all of the programs funded by the Foodgrains Bank network on multiple fronts.

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(SUCA Program Coordinator, Nairobi). Additional Winnipeg Foodgrains Bank staff who participated actively in this evaluation included Barbara Macdonald, Paul Hagerman, Stefan Epp-Koop, and Michael Salomons; and Anthony Ndirangu (administrative and financial support to the SUCA team).

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