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

AFRICA RESEARCH IN SUSTAINABLE INTENSIFICATION FOR THE NEXT GENERATION (AFRICA RISING)

MID-TERM EVALUATION
August 2016

USAID
FROM THE AMERICAN PEOPLE

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CONTENTS

ACRONYMS

ADVANCE	Agricultural Development and Value Chain Enhancement (Ghana)
ARBES	Africa RISING Baseline Evaluation Surveys
ATT	Agriculture Technology Transfer project (Ghana)
AVRDC	World Vegetable Center
CGIAR	Consultative Group for International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIMMYT	International Wheat and Maize Improvement Center
CIP	International Potato Center
CRP	CGIAR Research Program
EPA	Extension Planning Area (Malawi)
FGD	Focus Group Discussion
FTF	Feed the Future
ICARDA	International Center for Agricultural Research in Dry Areas
ICRAF	International Center for Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IER	L'Institut d'Economie Rurale (Mali's main national agricultural research entity)
IFPRI	International Food Policy Research Institute
IFSM	Integrated Soil Fertility Management
IITA	International Institute for Tropical Agriculture
ILRI	International Livestock Research Institute
IWMI	International Water Management Institute
KII	Key Informant Interviews
LUANAR	Lilongwe University of Agriculture and Natural Resources
M&E	Monitoring and Evaluation

MLN	Maize Lethal Necrosis
MSU	Michigan State University
NRM	Natural Resource Management
PCT	Program Coordination Team
PMMT	Project Mapping and Monitoring Tool
PVS	Participatory Varietal Selection
R4D	Research for Development
SAG	Scientific Advisory Group
SARI (E)	Sinana Agricultural Research Institute
SARI (G)	Savannah Agricultural Research Institute (Ghana)
SARI (T)	Selian Agricultural Research Institute (Tanzania)
USAID	United States Agency for International Development
ZOI	Zones of Influence

PROGRAM INFORMATION

Feed the Future Activity/Mechanism Name	Africa Research in Sustainable Intensification for the Next Generation (Africa RISING)
Feed the Future Activity Country/Countries	Ethiopia, Ghana, Malawi, Mali, Tanzania
Evaluation Lead Institution	
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EXECUTIVE SUMMARY

Background

The Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) program aims to reduce hunger and alleviate poverty through the adoption of improved technologies by smallholder farm households. Its strategy is to work through a research-for-development approach to assist poor, farming-reliant households move out of hunger and poverty through sustainably intensified farming systems that increase food, nutrition and income security. The program places particular emphasis on achieving outcomes relevant to the needs of women and children while working to conserve or enhance the natural resource base.

Africa RISING is part of USAID's Feed the Future Initiative and is led by the CGIAR (Consultative Group for International Agricultural Research). Africa RISING consists of three regional projects that focus on the sustainable intensification of crop-livestock mixed farming systems in the Guinea-Sudan-Savanna Zone in West Africa, crop-livestock integrated farming systems in the Ethiopian highlands, and cereal-legume-livestock integrated farming systems in the sub-humid and semi-arid zones of East and Southern Africa. Since its inception in October 2011, Africa RISING has been active in Ghana and Mali in West Africa, in Ethiopia, and in Malawi and Tanzania in East and Southern Africa. The International Institute for Tropical Agriculture (IITA) leads the work in the regional projects in West Africa and East and Southern Africa; the International Livestock Research Institute (ILRI) does the same in Ethiopia. IITA and ILRI partner with an array of national organizations and international institutions, most notably national agricultural research programs (NARS), other CG centers, and Michigan State University in Malawi. The International Food Policy Research Institute (IFPRI) is responsible for monitoring, evaluation and impact assessment.

Africa RISING's research for development activities are organized around four sequential objectives. The two research objectives center on the identification and validation of demand-driven options for sustainable intensification and on the evaluation of approaches that deliver and integrate innovations for sustainable intensification. The twin development objectives focus on the creation of positive outcomes and impacts in the action research sites and on the facilitation of partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites.

The 5-year program rests on the premise that targeted, strategically disseminated research will draw in development actors capable of scaling research results up and out. Its research-for-development structure and ambition aims to strengthen cooperation and lines of communication between research and development actors to hasten more effective transmission of research findings into the development domain.

It is important to recognize that Africa RISING did not begin from a well-defined proposal and program design. More than most research for development initiatives, it has evolved over time. However, a firm commitment to benchmark research communities is one of the most interesting and relevant characteristics of Africa RISING. Longer term R4D in the same communities endows Africa RISING with an institutional memory that is valuable and needed for sustainable intensification from technological innovations.

Evaluation

This evaluation used as background materials internally commissioned, external reviews that were conducted in 2015 for each of the three regional projects that comprise Africa RISING. Those reviews

were specific to each regional project and offered detailed micro-comments on progress and suggestions for improvement.

This evaluation is more macro in nature and has the benefit of being able to compare and contrast the regional projects in terms of their strengths and weaknesses. Its stated purpose is to provide USAID and implementing partners feedback on what is working within Africa RISING and what can be improved in terms of the program's management and organizational structures, including consideration of the status of partnerships and opportunities for harmonization across program sites. Given the program's R4D philosophy, the assessment aims to establish the progress of the research and development objectives toward reaching program-level outcomes, as well as the degree to which these objectives complement each other. To support this process, USAID prepared a series of questions related to Africa RISING's four objectives, and additional questions related to its organizational and structural approach.

With the current program ending in September 2016, the evaluation team was also asked to identify programmatic aspects that should be dropped, maintained or modified to better achieve research and development objectives, along with analysis of the potential benefits and challenges of continuing the program to a second 5-year phase.

Although this review is described as a mid-term evaluation, it commenced toward the end of Year 4 (of 5), and will not be completed until just a few months prior to Africa RISING's proposed completion date at the end of September 2016. Given this context, there is very little opportunity for the evaluation to affect the performance of the current phase of Africa RISING. However, both USAID and Africa-based partners are hopeful that the evaluation findings will assist in further consolidating thinking around the opportunities and challenges inherent in a possible second program phase. This context guided preparation and structure of this report.

Key informant interviews and focus group discussions generated the raw material for the evaluation. In total, close to half of the program's 84 action research sites were visited by the Evaluation Team in the five countries.

Findings

A core challenge for Africa RISING is the sheer scope of research options relevant to farming systems analysis, which encompasses cropping, livestock, soil health and the myriad interactions among them. The challenge is further complicated by the program's interest in the gender, nutrition and natural resource management elements of sustainable intensification.

The program is heavily invested in research related to cereal and legume cropping systems, including the introduction of new and early maturing varieties. Although these trials are producing important knowledge, and participants welcome and value them, there is concern among participating farmers that an over-emphasis on cropping systems has contributed to under-representation of activities related to livestock, soils and homestead farming systems. Deliberative approaches aimed at better understanding and addressing nutrition are also lacking.

Despite the relevance of its mandate, Africa RISING has been negatively affected since inception by a range of structural issues and implementation challenges, the impact of which has been compounded by the program design being premised on unrealistic expectations regarding what could feasibly be achieved in an abbreviated first phase. However, given the momentum observed during the course of the evaluation, **the primary recommendation of this review is that Africa RISING should be supported into a second phase, pending articulation of a clearer strategy and more explicit**

focus on farming system interactions.

The evaluation team's key findings are summarized below.

Slow start contributed to management challenges. An unusual identification and start-up period contributed to the program commencing before its structure and objectives had been fully thought through.

- A critical observation, well-documented in programmatic technical and management reports, is the significant amount of time lost to information gathering and strategic planning that would normally be determined prior to start-up, such as clarification of the program structure and implementation framework;
- This slow start rendered an already overly ambitious program near impossible to achieve in the allocated timeframe;
- These delays contributed to the late delivery of the program baseline, which in turn undermined Africa RISING's capacity to establish a robust farming systems-focused monitoring system given indicators would be generated from the baseline;
- Late hiring of key research scientists, especially in economics and gender, the instability in staffing of research partners, and long delays in the in-country and in-region posting of International Food Policy Research Institute social scientists also affected performance in the project's initial years; and
- The "quick wins" program initiated as a stopgap measure during Year One ran counter to development of an integrated farming systems approach and contributed to a subsequent lack of farming systems thinking in activity selection and implementation.

Program energy remains primarily focused on research and validation of technologies. Africa RISING's program logic comprises a continuum that aims to carry research to development to enhance sustainable intensification for smallholder farmers.

- The program's slow start means that it is still primarily positioned at the front end of the continuum, conducting research trials to validate component technologies of relevance to sustainable intensification;
- Consideration of how to seed and integrate these validated technologies throughout the development landscape is only just beginning, with the commencement of Research for Development (R4D) Platforms; and
- Impact pathways have yet to be developed in most instances, undermining the program's scaling ambitions.

Due to these issues, this report devotes considerable space to investigating Africa RISING's first research objective, *to identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability*. Currently, this is where the program is most heavily invested. And while this report considers progress in relation to development outcomes, it is in some cases only speculative because very little is actually occurring on the ground to analyze and comment on.

Crop-focused research is making solid progress. Africa RISING has generated relevant, high-quality research, much of which has focused on cereal and legume crops. Interest in the results of the crop research has sparked Mission buy-ins most notably in Malawi and Tanzania. Promising prospects for technological change include the following:

- Participatory Varietal Selection (PVS) played an important role in all AR countries, especially in 2012 and 2013 in selecting well-adapted recently released varieties. Modern varieties were introduced in the dominant cereal and grain legume crops in all AR countries. These improved

varieties and hybrids were mostly new to the beneficiaries who grew them. Most tested cultivars were earlier maturing than the varieties farmers were planting. Better crop management in the form of higher plant population from improved planting densities enhanced the productivity outcomes of these varieties;

- Across all the crops in the five countries, improved varieties of potato in Ethiopia appeared to generate the most interest bordering on excitement from both men and women farmers in the benchmark highland communities;
- The judicious use of inorganic fertilizer has featured prominently among the technological options for maize in Ghana and Tanzania and for wheat in Ethiopia. In Ethiopia, intensive trials over time in the benchmark communities show that response to fertilizer is conditioned by field position in the toposequence. This finding has the capacity to change both fertilizer recommendations and blend composition in Ethiopia. The Mission is aware of its potential importance and has tried to foster its use in a recent project on design of fertilizer recommendations. This collective approach offers an interesting macro-level advocacy roadmap for consideration by other countries;
- In Tanzania, the program's use of rock phosphate with collaboration from the private sector is innovative and generating interest; and
- In Malawi, a deliberate, focused strategy on doubled-up legume systems, well-managed and well-documented, resulted in the Government of Malawi's recent decision to officially endorse the system. Strip cropping of grain legumes with maize is also gaining ground in Ghana. The Mission in Lilongwe has recently committed to providing $4.5 million over 3 years to expand research and development activities, including shifting livestock activities from dairy to small ruminants and poultry.

These results have been generated with sound on-farm research methods for validating technology. Malawi has pioneered the use of mother-baby trials, and the large number of baby trials provides a solid foundation for subsequent research on early acceptance. In Ghana, community technology parks are an innovative construct that have allowed researchers to validate large numbers of field technologies in a cost-effective manner.

Rice – the missing staple. Africa RISING is currently doing very little in rice, despite it being a key crop in many areas. This relates to AfricaRice withdrawing from the program in its earliest stages. One option moving forward would be for Africa RISING to reconnect with AfricaRice to determine their interest to participate in any new phase. However, this is not recommended because inclusion of rice in Phase 2 on a par with maize and wheat would require the selection of new sites in Mali, Tanzania and Malawi, which would in turn mean a repeat of Phase 1 diagnostic and validation research. Africa RISING is too advanced to entertain that option, and it is too late to redress this programmatic gap in crop coverage.

Need for programming across all elements of sustainable intensification. Research in Phase 1 has been heavily focused on cereals and legumes, with only limited programming around livestock and homestead farming systems. This somewhat one-dimensional focus denies Africa RISING opportunities to explore synergies and opportunities for the integrated farming system approaches intrinsic to the concept of sustainable intensification. Nutrition is another important element of the sustainable intensification receiving insufficient focus

- Conventional livestock research on animal health and nutrition is not systematically conducted in intervention communities;
- Research on human nutrition is uneven and fragmented, though effective in the few contexts where it occurs; and
- Homestead farming systems are barely engaged, despite the homestead being where livestock is

housed, gardens are maintained and children reside.

Need for more overt focus on nutrition. Nutrition outcomes are explicitly stated in the program purpose and Africa RISING's research and development objectives. While the program is almost certainly having a nutritional impact among the participating cohort by virtue of increased and diversified agricultural production being achieved through cropping trials, few activities are deliberately focused on raising awareness of nutritional issues or measuring the nutritional impact of progressions brought about by improved agricultural practices.

Strong rates of women's participation, though concerns about their capacity. Although Africa RISING has succeeded in ensuring opportunities for women to participate, there is evidence of irregular performance in terms of how women are engaged and participate in the program, with planning and approaches being insufficiently gender disaggregated. It is also observed that Africa RISING's various research approaches have limited flexibility in terms of research adapting and having sufficient nuance to respond to the different contexts of men and women. Capacity building approaches appear to have been less effective with women than men, with the evaluation team observing that women were, at times, less able to explain the "why and how" of the technologies with which they participated.

In late 2015, a gender capacity assessment was undertaken in the East and Southern Africa project. The study was, in effect, a belated gender baseline study from which strategy and future performance can be measured. Need for the study was based in management recognizing gender analysis (including the use of its results for research programming) and the application of gender transformative approaches as areas requiring greater effort and focus. The study identified that skills, knowledge, and experience of gender analysis and gender transformative approaches are limited among research staff. A general lack of confidence among staff in mainstreaming gender in the program was also identified, as was a lack of clarity of the roles and responsibilities for program action on gender.

- Gendered approaches for capacity building seem to have been given insufficient attention;
- Younger women and young mothers are under-represented in the program where women's participation is almost uniformly the domain of older women, despite the program's focus on the "next generation";
- Research primarily reflects men's priorities, with limited activity in areas of interest to women (e.g., small ruminants, poultry and dry season vegetable production); and
- Specific gender capacity across the program is limited. While Ethiopia has had a gender coordinator appointed since commencement, it was only in 2015 that a gender advisor was appointed to work across the West and S&E Africa projects.

A role for youth. The program does not have a strategy for supporting youth in agriculture, despite its commitment to the "next generation." Africa RISING's self-selection approach to participation inevitably draws in more capable, experienced (and almost universally older) farmers as trial participants, with the expectation that knowledge and changed practice will trickle down to younger, less capable farmers.

The challenge of including youth is compounded by community elders positioning themselves at the front of the line in order to access free research inputs offered through the program, and made more complex by land ownership and fragmentation issues that make it difficult for youth to see a future in agriculture.

IITA currently implements a Youth Agripreneurs strategy aimed at harnessing the energy of youth to engage in agribusiness in Sub-Saharan Africa. Engagement by Africa RISING of such a program would be logical and potentially mutually beneficial.

Market awareness, analysis and action. Central to every aspect of Africa RISING's program logic is the urgent need for a better functioning agricultural marketplace, both as a point for accessing much-needed inputs and for sale of produce. This belief is shared by many development actors and is also integrated within other FTF-funded activities.
Resolving deeply flawed market systems is beyond the scope of Africa RISING. However, it is critical that market issues of fundamental relevance to the viability and adoptability of trials being rolled out are adequately addressed. Overall, marketing issues have been given insufficient attention within individual trials or sites, despite clear opportunities for strategic alliances with FTF-funded value chain activities in all countries of operation.

Input access. Africa RISING participants are commonly receiving trial inputs free of charge. This approach resolves the many significant challenges related to the poorly performing agricultural marketplace, where input access and affordability are key issues. It also means that farmers assume little risk and view the program's value through it subsidizing input costs that they would normally carry directly. In relation to livestock, the use of commercial feed as an input by scientists deters producers from considering options for using local feed sources, and also stifles development of linkages with private sector providers. Partial budgeting of economic outcomes of prospective technologies since 2015 in the West African and East and Southern Africa Regional Projects is a welcome development, but a heavy reliance on free access to "research" inputs over 3-4 years can distort the measurement of adoption potential. Therefore, more weight needs to be given to monitoring and early acceptance studies of tested technologies among non-project beneficiaries who reside in the community and who have some information on the performance of the technologies.

Need for strategic alliances to facilitate scaling beyond Africa RISING sites. An important indicator of success for Africa RISING is the degree to which it is able to develop strategic linkages with development partners capable of carrying research findings to development outcomes. Efforts to develop these impact pathways have been sporadic and have rarely been documented. Relationships with U.S. Missions were also observed as being insufficiently robust to ensure they carry enough information to assist in identifying opportunities for Africa RISING to complement or benefit from other FTF programs.

It also appears common to have no lines of regular communication between Africa RISING and other FTF-funded programs, even when potential synergies and complementarities are obvious. In northern Ghana, where Africa RISING encounters input access and technology issues, there was effectively no relationship with two FTF activities focused on those issues. Similar examples could be cited from across all countries. Conversely, Africa RISING's collaboration with FTF's Tanzania Staples Value Chain Activity (NAFAKA) is demonstrating the capacity of complementary programs working strategically to accelerate the scaling and delivery of agricultural technologies.

In order to achieve its scaling ambitions, Africa RISING needs to be more aware of, more closely engaged with and better connected to the various development communities in its areas of operation—both literal communities, but also communities of practice. While there is an imperative for all development programs to be good communicators and active in relationship management, these aspects are particularly critical for a program such as Africa RISING where success is so clearly intertwined with scaling opportunities. If Africa RISING fails to mobilize its impact pathways to scaling, then it has failed just like so many research focused programs before it.

R4D Platforms. The lynchpin for relationship management within Africa RISING's program logic is the R4D Platform, which aims to draw together key stakeholders relevant to sustainable intensification. However, to date the platforms' capacity is almost universally characterized by a lack of inclusiveness

and limited participation of key stakeholders. Several key development actors approached during the evaluation were not even aware of the R4D Platform. In better examples, such as Malawi, the R4D Platform has been integrated within an existing coordination mechanism, the District Agricultural Extension Coordination Committee. Ethiopia is also making solid progress in terms of including key local actors in its platforms. Such approaches allow greater stakeholder ownership of the activities and knowledge of Africa RISING.

- In theory, R4D Platforms should form an important gathering point for agriculture actors in localized areas and be an important mechanism for dissemination and scaling of Africa RISING learning;
- Although establishing networks is relatively easy, sustaining them is complex and requires unique skills. Management of the platforms appears to be impromptu, lacking coherent strategy and resources, and the platforms themselves appear to have been developed in a form that does not proactively court participation of the broader agriculture and livelihoods sector;
- In some locations (e.g., Koutiala, Mali), similar competing agricultural development mechanisms exist. It is vital wherever overlap or competing mechanisms exist that effort is made to harmonize coordination and information sharing approaches; and
- It is vital for R4D Platforms to be designed so they are driven by and respond to local communities' needs and priorities, and not fall into the trap of unwittingly being driven primarily to meet Africa RISING's agenda. The outcomes of the platforms' meetings also need to be more transparently communicated to establish their relevancy and impact on decision-making.

Less disparate program staffing. Another partnership aspect of Africa RISING relates to the different CGIAR system partners working alongside one another. High numbers of partners and affiliated CGIAR scientists can lead to an impression of critical mass that may not actually be on the ground. The number of CGIAR scientists listed as program participants equates to about one-third of a full-time equivalent scientist, and some do not allocate more than 15 percent of their time to the program. This contributes to the need for complex and costly sub-contracting arrangements, making the original value of the CGIAR Center less evident.

Greater private sector engagement. The evaluation team notes that the program appears to have only limited direct relationships with the private sector, denying it in areas related to input access, marketing, new technologies and technical support. Engagement of private sector actors is critical to ensuring sustainable mechanisms in the future.

Program monitoring. While the program has produced a library of documentation detailing the results of research, formal program monitoring of program performance specifically measured against program objectives is limited and unconvincing. Key data such as adoption rates of trialed technologies are not routinely captured, denying the program an evidence base to underpin its efforts to encourage scaling.

Moving forward, a second phase is in need of a more complete programmatic approach that better leverages the potential of the program and learning occurring across its many sites. A more deliberate approach to knowledge management, knowledge sharing and more strategic program monitoring is also needed.

Given the conclusion that the program was never likely to achieve its ambitious objectives in the initial program timeframe, it is imperative that any subsequent program clearly identifies and articulates a plausible strategy for scaling of its results into development outcomes.

Recommendations

Below are 13 important and specific recommendations distilled from the discussion of those listed in Section 6 for Phase 2:

1. Africa RISING should continue in the same benchmark community sites in Phase 2, but its current cohort of direct beneficiaries (i.e., those that receive direct input subsidies) should be graduated out of the program and replaced by new beneficiary households to maximize technological exposure within the community.

2. Early acceptance of tested technologies needs to monitored and evaluated more formally so that the evidence base for scaling up and out is on a firm footing.

3. Early in Phase 2, Africa RISING should engage in a "quick and clean" priority setting for both research and development. Priority setting implicit in the second phase proposal should be revisited across the five countries on a more systematic basis as the availability of funds becomes more transparent. Although recognizing that well-defined crop research will still be important, the evaluation team recommends that relatively less attention be given to crop management, specific-disease resistance, aflatoxin technology, and varietal change and that increasing weight be assigned to livestock and more integrated areas such as homestead production and farming systems interactions.

4. Africa RISING should place more deliberate emphasis on gender-disaggregated planning and on supporting women's specific areas of interest in small ruminants, poultry, dry-season vegetable production and homestead production.

5. Use nutrition-focused activities as an entry point to elicit greater participation from younger women, who are not now active in the program.

6. Africa RISING should prepare a program-level "guide for (or principles of) effective on-farm livestock research" to assist in establishing a realistic and feasible research agenda that examines issues related to animal health, genetics and feed. This would help in aligning results across countries.

7. Africa RISING management should try to flesh out the strong skeleton of research partnerships negotiated in Phase 1. Demand for institutional gap-filling includes partnering with a creditable national university program in Mali, linking up with the private sector on well-defined opportunities such as maize hybrids and treated seed products, and widening CG participation in Ghana in general and in maize research in Tanzania and Mali, in potato in Tanzania, and in enset research in Ethiopia in particular.

8. Using the results of a recommended stakeholder mapping exercise, the program should work to ensure platforms are sufficiently inclusive and not competing. Where other similarly focused platforms or networks exist, the program should work with those parties to rationalize into one mechanism driven by key local actors.

9. In Phase 2, IFPRI needs to conduct focused investigations that support the research and development activities of AR. The M&E system is more or less in place and now needs emphasis placed on better and more reliable mechanisms for local level monitoring, from which entities such as IFPRI can play an important supportive role in determining program-level outcomes and impact.

10. More field research staff should be employed directly by the CG Center responsible for a regional, country or sub-regional project within AR. At least one internationally recruited scientist from IITA and ICRISAT should reside in the two sub-regions where AR's research is conducted in Tanzania.

11. In Phase 2, AR management should augment program staffing in key areas that would service and supervise work in Research Objective 2 and Development Objectives 1 and 2 at the program level across the three projects. Candidates for staffing at the program level include a seed production

specialist, a GIS presence, and a social scientist vested with early adoption research. Consistent staffing levels at local levels should also be considered, given the apparent correlation between local-level capacity and stronger collaboration with and ownership from local actors.

12. Emerging success stories from Phase 1 will continue to require nurturing in Phase 2. For example, in Ethiopia, maintenance research on bacterial wilt will be important to sustain gains made in potato's expansion attributed to Africa RISING. Investing in events and opportunities that enhance the potential that findings on site-specific nutrient management influence decision-making on fertilizer recommendations and blends should be a priority, with successes achieved in Ethiopia acting as a guide for new approaches.

13. Sustainable intensification also needs to be made more operational, not just with indices but also with field measurement of important variables, such as nutrient depletion, in a longer term research setting in farmers' fields which corresponds to Africa RISING's comparative advantage among R4D programs. Likewise, quantifying the interaction of drought and technological outcomes should receive more emphasis in Phase 2 than it did in Phase 1.

Structure of this report

This report is divided into six sections:

- Section 1 introduces Africa RISING by presenting its stated structure, objectives, outcomes and program logic, assembled from the library of program documentation made available to the evaluation team. As the report findings illustrate, the evaluation team observed gaps in the program theory and logic detailed in this executive summary.
- Section 2 defines the evaluation purpose and questions as detailed in the evaluation terms of reference, as prepared by USAID.
- Section 3 describes the evaluation approach, methodology and limitations.
- Section 4 details evaluation findings, considering progress against the four program objectives and analyzing overall progress as an integrated, holistically focused R4D program.
- Section 5 outlines the evaluation team's assessment of lessons learned during implementation.
- Section 6 presents recommendations for a possible Phase 2 of Africa RISING.
- Annex A contains evaluation questions.
- Annex B contains a list of key informants.
- Annex C contains the Phase 1 field trip itinerary.
- Annex D contains the Phase 2 field trip itinerary.

I. INTRODUCTION

A. Summary

Africa RISING[1] is a 5-year, $50 million program designed to support action research through strategic partnerships that identify and/or validate **scalable options** for sustainable intensification of key African cereal-based farming systems. Sustainable intensification of mixed-crop livestock systems is regarded to be a relevant and key pathway toward better food security, improved livelihoods and a healthy environment for smallholder farm households.

Working across three distinct agro-ecological zones, the program comprises three research for development (R4D) projects supported by USAID as part of the U.S. Government's Feed the Future (FTF) initiative. The overwhelming majority of Africa RISING's areas of operation overlap FTF Zones of Influence (ZOI).

Project sites were chosen under guidance of IFPRI on the basis of balancing need and potential for successfully improving agricultural productivity. The program's primary partner is the Consultative Group for International Agricultural Research (CGIAR) system; different CGIAR system partners participate on the basis of their relevance, capacity and potential value add to the ecosystems that the program targets.

At project and country levels, different CGIAR system partners have been chosen to assume a lead coordinating role:

1. Africa RISING/West Africa is led by The International Institute of Tropical Agriculture (IITA), with interventions in Mali and Ghana. In Ghana, IITA coordinates activities, based in the key northern city of Tamale. In Mali, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) coordinates activities from its base in the capital, Bamako.

2. Africa RISING/Ethiopian Highlands is led by The International Livestock Research Institute. Based in the capital, Addis Ababa, the institute maintains small offices in the four areas of operation.

3. Africa RISING/East and Southern Africa is led by IITA, with interventions in Tanzania and Malawi, and a component project in Zambia added in Fiscal Year 2014. In Malawi, activities are jointly coordinated by IITA and Michigan State University. In Tanzania, IITA coordinates Africa RISING activities from its base in Arusha. It also coordinates activities in Manyara region; ICRISAT coordinates activities in Dodoma region.

Africa RISING's aim is to create opportunities for smallholder farm households to move out of hunger and poverty through more effective implementation of sustainably intensified farming systems that result in improved food, nutrition and income security. It places particular emphasis on responding to the needs of women and children, as well as initiatives that conserve or enhance the natural resource base.

The program began in early 2012 through a process of short-term "quick-win" interventions that allowed "rapid assessment" of a broad range of options likely to fit well with its remit. These activities

[1] As per the original Africa RISING program documentation, this report uses "program" to describe the overall Africa RISING effort and "project" to describe each of the three regional/agro-ecological zone efforts. The three projects comprise the Africa RISING program.

supported assembly of an updated knowledge base from which decision-making around the program's longer-term focus could occur. This "quick win" process was significant in shaping the final research portfolio; it also helped facilitate and clarify Africa RISING's structure, roles and responsibilities, as well as clarified potential opportunities for partnerships with national and international research partners, NGOs and government agencies.

Another important output emerging from Year 1 was an agreed-upon Africa RISING Program Framework 2012-16, released in November 2012.

B. Program Structure: Goals and Outcomes

Africa RISING aims to bring together a strategically identified range of research and development partners to facilitate R4D approaches that result in meaningful, relevant and locally applicable on-the-ground results for smallholder farmers. Strategically identified and complementary research and development initiatives are seen as a valid process for identification of realistic pathways for smallholder farmers to sustainably move beyond the poverty and hunger that is endemic to their demographic, especially within the targeted regions/agro-ecological zones.

By design, the composition of these R4D alliances is supposed to be strategically determined according to context-specific factors and opportunities while respecting the need and potential benefit of Africa RISING practicing a degree of standardization and harmonization between sites. To this end, insightful management and monitoring of local implementation is viewed as vital, as is a degree of flexibility in building a clearly focused and holistic country portfolio. Research approaches are deliberately designed to not be overly prescriptive, allowing individual research teams to build on previous research, their own past experience and the research of others in the area, and to exercise their creativity in developing workable solutions to farmers' problems. In many cases, the program's focus is on validation of known technologies, with the aim of assembling a more conclusive evidence base capable of promoting adoption. Dissemination of results and strategic engagement of key government and non-government actors is another vital component of the program logic.

Partners within the various country-based alliances have been drawn from the CGIAR family, national agricultural research and extension systems, academia, farmers, farmer organizations, input and output dealers, international and national NGOs, and policymakers. Guiding construction of these alliances is the objective of developing management practices and technology combinations that better integrate crops (cereals, legumes, fruits and vegetables), livestock (including poultry), trees, and shrubs in mixed-farming systems to improve whole-farm productivity, nutrition, and incomes of small-farm families without degrading the environment. Alliances should in theory also promote innovations that more effectively link farmers to markets and input suppliers. They must also ensure local capacity for high-level community engagement so vitally important socio-economic and cultural factors are understood and responded to within local contexts. Collectively, local alliances should present a valid continuum capable of carrying research to development—the impact pathway.

B1. Research Outputs

The program is organized around three research outputs:

1. ***Situation analysis and program-wide synthesis*** includes activities necessary to ensure that "best bet" or "best fit" technological interventions are responsive to farmers' priority constraints while ensuring program capacity and structures that enable program-wide synthesis related to lessons learned across the three projects.

2. ***Integrated systems improvement*** builds from a broad, open-minded approach to participatory technology identification, adaptation and effective combination aiming to improve farming systems in terms of productivity, income and natural resource management. Integrated approaches and optimizing synergies between different activities is regarded as key.

3. ***Scaling and delivery of integrated innovation*** allows the development of approaches for the scaling up and scaling out of systems innovations to similar development domains. Strong capacity for outcome-oriented partnership management, results dissemination and accessible communications are all implied within this output.

B2. Objectives and Outcomes

Reflecting Africa RISING's integrated R4D mandate, activities are focused on four research- and development-oriented objectives and five outcomes.

Research Objectives

1. To identify and evaluate demand-driven options for sustainable intensification that contribute to rural poverty alleviation, improved nutrition, equity and ecosystem stability
2. To evaluate, document and share experiences with approaches that deliver and integrate innovation for sustainable intensification and promote their uptake beyond the Africa RISING action research sites

Development Objectives

1. To create opportunities for smallholder farm households within Africa RISING action research sites to move out of poverty and improve their nutritional status—especially of young children and mothers—while maintaining or improving ecosystem stability
2. To facilitate partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites

Program-Level Research Outcomes

1. Integrated innovations increase production and/or improve productivity in a sustainable manner for the most relevant farm typologies within the Africa RISING research sites
2. The aggregated impact of these farming practices at the household/farm levels contributes to an improved understanding of ecosystem stability at the landscape level
3. Wider dissemination of integrated innovations for sustainable intensification leads to similar impacts beyond the Africa RISING action research sites

Program-Level Development Outcomes

1. Wider adoption of innovations identified and tested by the program's outputs within the Africa RISING action research sites enhances livelihoods through increased agricultural output, income diversity, reduced vulnerability to adverse environmental and economic challenges, and improved nutrition and welfare, especially of young children and mothers
2. The development community initiates programs based on the knowledge, tools and innovations developed and promoted by Africa RISING, directed at developmental goals consistent with the program's purpose

Day-to-day implementation of each of the three projects occurs in a relatively independent manner, given that different institutions assume the lead role in different countries. There is no permanent mechanism for overall coordination among the three projects. There is also relative independence within individual country portfolios, allowing for adaptation to context, and in response to locally available expertise. With the exception of Ethiopia, it is common across the program for CGIAR system principal investigators to not be based in the country where their particular trial of interest is occurring.

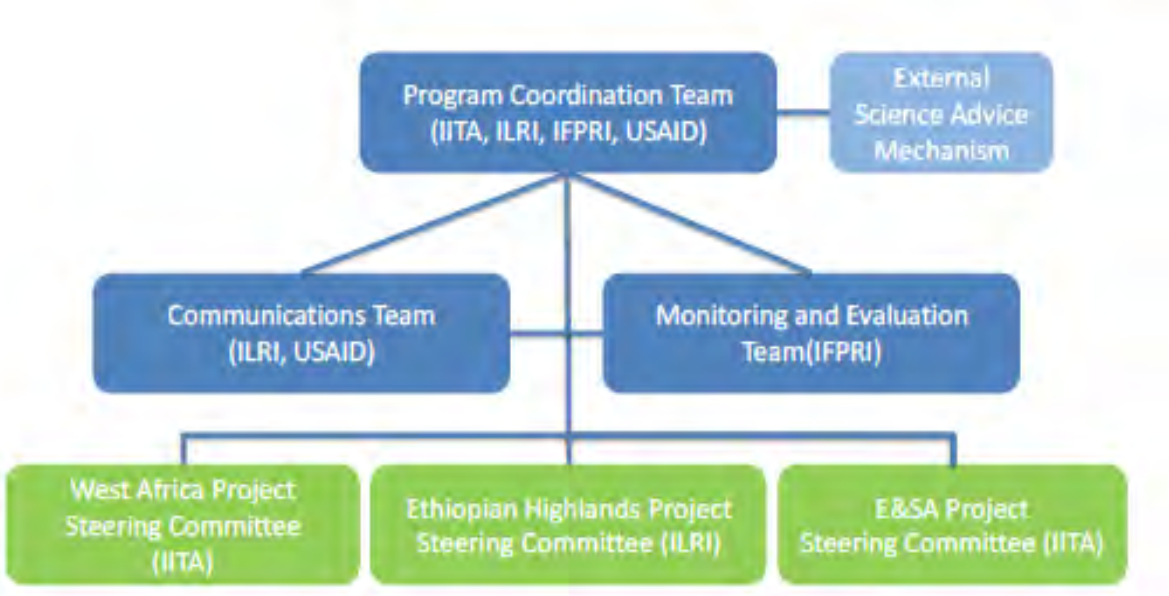
This forces significant reliance in some countries on the work of local partners, augmented by irregular visits by remotely based CGIAR system researchers with relevant disciplinary expertise.

Despite relative autonomy at the local level, program coherence is, in theory, achieved by each of the three projects being guided by Africa RISING's program logic and shared operating principles, and the imperative for knowledge to be shared across and between activities, countries and projects.

Overall program management and coordination occurs through a program coordination team (PCT), composed of lead people from across the program, including USAID and the International Food Policy Research Institute (IFPRI) as the contracted agency responsible for program monitoring and evaluation (M&E). The role of the PCT is to ensure the three projects are implemented in a manner that is consistent with and contributing to the program whole. This is achieved through information sharing and monitoring that allows the program to take decisions that help ensure the relevance of all day-to-day, local activities to achieving program-level outcomes. A key role for the PCT is to ensure rigor, complementarity and synergies in local-level strategy development, and ensuring each region can benefit from the experiences and successes of other regions.

The PCT meets in person annually and virtually on a quarterly basis. Its chair revolves annually between IITA and the ILRI. Further support is provided through a Scientific Advisory Group (SAG), which focuses on the overall strategy and direction of the program, program coherence and opportunities for partnership. Exhibit 1 below shows the Africa RISING program structure.

Exhibit 1. Africa RISING Program Management Structure



B3. Monitoring and Evaluation

The Washington, D.C.-based Spatial Data and Analytics Team (previously HarvestChoice) within IFPRI has overall responsibility for M&E and impact assessment across all three activities, including preparation of the program baseline. At project and country levels, local partners are responsible for day-to-day monitoring of local trials and activities.

Overall, the goal of Africa RISING's M&E system is to support effective project management, provide data for timely reporting to donors, including FTF performance management data, and provide learning on what did and did not work. This knowledge should inform the design and implementation of new interventions, as well as help facilitate adjustments to ongoing activities that might enhance efficiency and effectiveness.

Beyond the need to satisfy standard/conventional M&E requirements, the program's M&E plan also describes activities designed under an expanded program M&E scope, including:

1. A structured stratification schema (by geography and household categories) and action research and control site selection process
2. A program-wide, spatially enabled M&E data management and sharing platform open to program participants and stakeholders
3. Initial steps in embedding a farming-system modeling capacity into the program's M&E toolkit.[2]

C. Africa RISING Program Logic

A central driver underpinning USAID's decision to invest in and design Africa RISING was recognition that, although extensive agricultural research has occurred over a long period of time in the program's geographical and technical areas, uptake of the results emerging from this research has been at best sporadic. The program's ambition, therefore, is to address this "disconnect" by ensuring impact pathways are in place that help ensure research findings actually result in development outcomes, as evidenced by increased incomes, improved nutritional status and greater ecosystem stability in target communities.

To this end, Africa RISING aims to be highly aware of and responsive to the social, economic, demographic and agro-ecosystem contexts that have previously inhibited uptake of "proven" technologies. According to its conceptual framework and guiding principles, the program will position itself to better understand the many complex factors that affect famers' capacity for adoption, factoring such issues into research approaches while simultaneously working in the development domain to resolve obstacles. Working across three different agro-ecological zones, Africa RISING's approach is to construct development domains that take into account the combined impact of three key drivers affecting intensification: population density, market access and agro-ecological potential.

With support from IFPRI, the program identified farming systems in these domains that reflect different human population and livestock densities, as well as agro-ecological and market potential for sustainable intensification. Within these systems, farm typologies are being developed and better understood, and entry points toward sustainable intensification identified based on the overall characteristics of specific development domains and farming systems, while also considering resources available at household level.

The program approach is to integrate mechanisms to test and validate research findings; this will determine the need for further trials and to assess their viability for scaling up. Ensuring high-quality, scientifically valid results explains the positioning of the program within the CGIAR system, given the system's history and capacity for high-level agricultural research. Additional program-level mechanisms such as the SAG aim to ensure high-quality expertise is on hand to guide program decision-making.

Research approaches are designed to be inclusive, accessible and capable of developing capacity at multiple levels, allowing opportunities for participation of stakeholders such as national agricultural research bodies, local universities, national and international development partners, farmer-based

[2] Drawn from the Africa RISING website: *www.africa-rising.net.*

organizations and farmers themselves. The aim of this approach is to disseminate knowledge while building local capacities and ensuring research remains connected and responsive to local-level realities, opportunities and changes.

Recognizing that system interventions require engagement and a sense of ownership among the various research and development partners, R4D platforms (referred to as Innovation Platforms in some program locations) have been constituted to facilitate meaningful and effective interactions between stakeholders. Their role is to help prioritize, guide and evaluate the effectiveness of research and development processes. By including private sector actors, these platforms are seen as having potential to connect farmers to value chains. It is expected that R4D Platforms will have sufficient capacity to design, implement and evaluate project activities and disseminate research findings, and generally be central in carrying research to development and ensuring local ownership of program results.

While the program approach has the potential to directly affect the lives of farmers who participate at the action research sites, the program's grander ambition is to promote and disseminate results that can be taken up by other development actors beyond the Africa RISING research sites. This demands an acutely focused communications strategy for dissemination of results with relevant development and private sector actors, as well as high-quality partner engagement and relationship management.

D. Evaluation Context

Although this review is described as a mid-term evaluation, it commenced toward the end of Year 4 (of 5), and will not be completed until just a few months prior to Africa RISING's proposed completion date at the end of September 2016.

Given this context, there is very little opportunity for the evaluation to affect the performance of the current phase of Africa RISING. However, both USAID and Africa-based partners are hopeful that the evaluation findings will assist in further consolidating thinking around the opportunities and challenges inherent in a possible second program phase. This context guided preparation and the structure of this evaluation.

2. EVALUATION PURPOSE AND QUESTIONS

The stated purpose of this evaluation is to provide USAID and implementing partners feedback on what is working within Africa RISING and what can be improved in terms of the program's management and organizational structures, including consideration of the status of partnerships and opportunities for harmonization across program sites. Given the program's R4D philosophy, this evaluation aims to assess the progress of the research and development objectives toward reaching program-level outcomes, as well as the degree to which these objectives complement each other.

Implicit within the evaluation scope of work is the need to assess the relevance and capacity of Africa RISING's program logic to positively affect smallholder farming communities in target areas. Assessing strategy, progress and positioning in terms of the program's development of pathways for scaling program results into the broader development community is also vital.

With the current program ending in September 2016, the evaluation team was also asked to identify programmatic aspects that should be dropped, maintained or modified to better achieve research and development objectives, along with analysis of the potential benefits and challenges of continuing the program to a second 5-year phase.

To support this process, USAID prepared a series of questions related to Africa RISING's four objectives, and additional questions related to its organizational and structural approach. These questions are detailed in Exhibits 2-4 below. As part of the evaluation planning process, the evaluation team prepared indicative outcomes and outcomes measures in response to the questions posed by USAID. These are included in Annex A.

Exhibit 2. Questions Relating to Research Objectives

Research Objective 1: *Identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity, and ecosystem stability*
• To what extent has the research program developed scientifically valid and robust conclusions and professional-level outputs in the different sites? (Outputs include the experimental design, publications/presentations, and demand-driven options [technology or innovation packages.]) • What opportunities are there to increase the number and/or quality of research outputs and outcomes? • How effectively do the different research partnerships contribute toward a rigorous process and quality research outcomes? • What opportunities are there to improve partnerships? Are there other potential partnerships? • To what extent are capacity building elements promoted throughout the research program? Are there other areas in which capacity building can be supported? • How well are gender, climate change and nutritional considerations integrated into the research program overall?

Research Objective 2: *To evaluate, document and share experiences with approaches for delivering and integrating innovation for sustainable intensification in a way that will promote their uptake beyond the Africa RISING action research sites*
• How effectively are research designs harmonized among partners across sites (within appropriate regional contexts)? • How have the sites resolved the tension between standardization and contextual differences? • What opportunities are there to encourage the application of research outcomes to appropriate, comparable sites? Both among Africa RISING research sites and beyond?

Exhibit 3. Questions Relating to Development Objectives

Development Objective 1: *To create opportunities for smallholder farm households within Africa RISING action research sites to move out of poverty and improve their nutritional status—especially of young children and mothers—while maintaining or improving ecosystem stability*
• What are some of the more promising technology or innovation packages developed for adoption by smallholder farmers? • What are the criteria used to define "promising" technology or innovation packages? • What are the similarities and differences in criteria among the different research sites?

Development Objective 2: *To facilitate partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites*
• To what extent has the impact pathway delineating the steps from field research through to scaling (dissemination and adoption) been mapped out and used by the different elements within Africa RISING? • In what ways have relevant partners (especially Missions and private sector) been engaged in the different stages along the impact pathway? What other partners could be engaged? • What opportunities are there for current and potential partners to contribute further to Africa RISING? • What opportunities are there to maximize dissemination of technology or innovation packages to smallholder farmers? • What are some of the challenges to dissemination the project needs to address?

Exhibit 4. Questions Related to Africa RISING's Management and Approach

Effectiveness of program organization and structure in supporting achievement of program goals
• How effectively have program leaders and managers communicated the program's strategic vision so that partners feel a part of the whole program? • How well are the various administrative components harmonized across the sites? (Are information transfer between sites, sharing of lessons learned and collaborations evident?) • Are there systems in place that allow for communication and transfer of data and information between the different sites? To those outside the program? • What opportunities are there to improve harmonization and collaboration among the different partners and between the sites? • What are some of the challenges that the project needs to address to strengthen the different partnerships? • Is a data management system in place to collect, track and report on FTF and custom indicators, outputs, outcomes and impacts, both vertically from the beneficiary level to the partner level to the policy level, and horizontally across the programs? • Do the collection and reporting conform to USAID requirements?

3. EVALUATION METHODS AND LIMITATIONS

A. Evaluation Approach

A central challenge of this evaluation was to determine the degree to which Africa RISING is generating innovations and solutions that are relevant and deliverable within the overall livelihoods context of smallholder farm households. It therefore required an approach that helped establish whether or not a clear and plausible line of sight exists along the continuum of Africa RISING's program logic, which can be summarized as follows:

- Identifying and understanding priority needs as expressed by smallholder farming households
- Articulating and preparing research questions responsive to those needs
- Ensuring those needs are adequately reflected in program-supported research activities
- Being effective in building capacity to ensure farmer ability to implement new technologies
- Ensuring social, economic and environmental constraints to adoption are understood and being addressed within research approaches
- Having capacity to monitor whether or not smallholders are practicing or considering actual or potential modifications to farming systems in research areas
- Demonstrating awareness, engagement and inclusion of local stakeholders
- Assessing the program's capacity to communicate results and nurture adoption
- Having lines of communication and strategies in place to facilitate scaling
- Analysis of the effectiveness of management approaches to achieving project goals

While efforts were made to achieve standardized evaluation approaches across the countries visited, it was also accepted that there needed to be significant flexibility given profound variation across the program in relation to resourcing, staffing, governance and local capacity. Most notable was the degree of access to CGIAR Center staff and responsible researchers which varied from near total access in Ethiopia to very limited in Ghana, where few centers maintain offices.

Preliminary consultations were undertaken with key Africa RISING informants to understand contextual differences across sites and ensure that the most relevant cross-section of research types, locations and farmer practices were accessible through the evaluation field work. Collectively, the evaluation team worked through a logical sequence of desk review, evaluation planning and consideration of results reported (e.g., FTF data) to determine optimum use of time during its two field visits. Key informant interviews (KII) and focus group discussions (FGD) were the primary tools employed to gather qualitative data, allowing for consideration of program performance from multiple entry points. Community visits also presented opportunities for observational analysis and opportunistic meetings with local informants.

While quantitative data were accessed and utilized, data collection focused primarily on the gathering of qualitative data from a cross-section of key informants with the aim of assessing the degree to which the program had achieved traction in target communities and among local stakeholders. Data gathered were cross-checked and triangulated from multiple sources and against available quantitative data.

The evaluation approach was to simultaneously examine the nuance of project implementation in significantly varied contexts while maintaining a focus on overall progress toward program-level research and development outcomes. This involved assessment of the relevance of the research portfolio to each context and exploring the validity of the program logic in responding to the needs of smallholder farming families. Central to this was assessment of the likelihood that the target group would adopt the technology packages emerging from the research—outside the considerable incentives of the program's high-quality input provision.

Other factors identified as relevant to measuring progress toward objectives and outcomes were:

- Strengths (and weaknesses) of Africa RISING's structure in terms of program documentation, management, staffing and partners
- Organization and implementation factors, including the efficacy of program processes for information sharing and dissemination of results (both internally and externally)
- Depth of ownership and involvement in research activities by other important development actors, including government agricultural staff, local civil society and the private sector
- Degree to which a genuine space exists within the program approach for meaningful inclusion of women's perspectives in programming

Considerable variability in performance within countries and across sites was expected. This was exacerbated by political unrest in Mali and serious drought in different locations that meant that "normal" growing seasons were not possible. It was also important to understand management strategies for monitoring and ensuring consistent performance across the program.

While not an exhaustive list, key informants primarily came from the following cohorts:

- Implementing CGIAR system partners
- Other CGIAR system partners according to their project/country specific contributions
- National agricultural ministries and agricultural research centers
- Development partners
- USAID Missions
- Staff of other agricultural programs (particularly FTF) with potential to support scaling up
- Private sector entities engaged by the program
- Farming families

A detailed list of key informants and a description of proposed evaluation tools used is in Annex B.

B. Evaluation Limitations

Africa RISING is an ambitious and complex program active to significantly varying degrees in 84 research sites across six countries. Limited time in the field, long distances between research sites, the sheer number of activities under implementation and the dispersed nature of many key informants were some of the challenges encountered. Definitively determining the validity of every research activity was therefore beyond the scope of this one, relatively brief evaluation. However, strategic sampling of different variables across the program helped ensure that most major facets of Africa RISING's investigation of sustainable intensification options were encountered and considered.

The nature of CGIAR system implementation also presented challenges in terms of the availability of participants, given that it is common for participating CGIAR staff to not be on the ground in the country where trials are occurring. This requires remote management of research sites by local actors, and also required assessment by the evaluation team of the efficacy of delegation arrangements.

Cultural factors also presented a kind of limitation, in that there were cultural expectations within communities related to participation in the review. For example, while FGDs were designed to have a limited number of participants, whole communities often stood nearby and contributed to discussions. Language also presented a challenge, given that multiple languages were often spoken within a community. Though every effort was made to ensure local language capacity, the technical nature of the discussions often presented challenges for the translators that were recruited for the evaluation. This at times left the evaluation team reliant on local agriculture department staff who were beneficiaries of the program in terms of training and resources provided.

Accommodating gender differences was another complex challenge given that women were often reluctant to speak up in front of men in many of the cultural contexts encountered—a situation compounded by the all-male evaluation team. This was mostly overcome through gender-disaggregated FGDs that gave women space to guide conversations and participate more actively than if they had been grouped with men. However, even with this gender disaggregation, it was common for more affluent, empowered community members (male and female) to dominate group meetings. This in part relates to Africa RISING's strategy of identifying and working with "lead farmers" who by definition tend to be more successful and better resourced, and who are often community leaders. The evaluation team attempted to overcome this bias by working to create opportunities to meet with individual focus group participants at their farms. Although this strategy was mostly effective, time constraints often precluded visits to participants in more remote locations—significant, given that distance from a community center is a disadvantage in its own right.

The degree to which the evaluation team was embedded with partner agencies was also a delicate balancing act. CGIAR system partners and the evaluation team were in full agreement about the importance of the team operating independently at the community level. However, it was also necessary for CGIAR system partners to be present in some form to introduce and contextualize the evaluation team's work for the community. Understandably, local farmers were often unable to explain the fullness of trials with any scientific rigor, which meant that it was important for program representatives to be on hand. This tension was discussed prior to community visits, with CGIAR system partners doing their best to ensure an appropriate distance from the evaluation process. Despite this, it was apparent (and perhaps inevitable) that farmers often looked to them for guidance in how to answer questions.

A related challenge was the clear desire among focus group participants across most activity sites to speak positively of Africa RISING, most likely in an attempt to ensure continuation of the flow of inputs coming to them through the program.

While such challenges are common to an evaluation of any program working with very poor people, it highlights a core implementation challenge. Overwhelmingly, Africa RISING is perceived by community-based participants and observers as a "regular" development project, with limited appreciation being observed at community level of the difference and implications of the program being guided primarily by a research agenda. This contributes to a disconnect and unrealistic expectations with regard to what Africa RISING can and cannot do in support of a community's development. It also occasionally leads to resentment among non-participants who struggle to understand why such a well-resourced program is conducting so few trials. This context also has the potential to distort findings related to the likelihood of adoption of new technologies, given that at this point participants' understanding of new technologies is distorted by their efforts to continue to be the recipient of the various free inputs on offer.

For this evaluation, this challenge was partially addressed in terms of finding more and more time over the course of the evaluation to allow deeper and more detailed discussion with individual households to conduct case studies of their farming context, the depth of their knowledge of the technology being promoted, their understanding of the program approach, and their capacity to locate and/or afford the various inputs required of a technology beyond the life of Africa RISING.

4. EVALUATION FINDINGS

This section lays out findings of the Africa RISING evaluation team following completion of two stages of field work that occurred during 4 weeks in September/October 2015 (Ghana and Mali) and 5 weeks in February/March 2016 (Ethiopia, Malawi and Tanzania). Findings are divided into four sub-sections. The first involves consideration of structural issues that the evaluation team regards as being relevant to and having affected program implementation. The second considers the program concept and logic, and whether or not the various elements implied in the concept of sustainable intensification have been sufficiently addressed. The remaining sub-sections look at program performance in relation to research objectives, development objectives and program management, and the interplay among the three.

A. Structural Findings

It is important to first highlight and acknowledge that Africa RISING is well-conceived and relevant, with the potential to make a significant contribution to poverty reduction in the current economic and environmental context of Africa. The program, operational in key agro-ecological zones, is well-positioned to bring significant expertise and nuanced understanding to the challenge of sustainable intensification of smallholder farming systems, as well as enhance understanding and capacity in relation to the interplay known to exist among cropping, livestock and soil health.

Its research-for-development structure and ambition is also relevant, its goal being to strengthen cooperation and lines of communication between research and development actors with more effective transmission of research findings into the development domain. Enhancing the efficacy of this critically important linkage between research and development workers is widely regarded as long overdue.

Despite its relevance, Africa RISING implementation to date has been negatively affected by a range of structural issues and implementation challenges. The impact of these challenges is further compounded by the program design being premised on unrealistic expectations regarding what could feasibly be achieved in an abbreviated first phase.

A lead structural observation is the housing of Africa RISING's work in the CGIAR Research Program on the Humid Tropics, despite all 13 sub-regions in its geographic area of interest being more accurately classified as semi-arid tropics. From 2011-12 and 2015-16, annual rainfall variability was not marked in

West Africa, but Ethiopia, Malawi and Tanzania experienced frequent droughts. Despite drought being the main source of ecosystem instability in the target area, research on the incidence and consequences of production variability in general and drought in particular is largely absent in Africa RISING. Validation of drought escape and tolerance of released cereal and grain legume varieties has been the program's main intervention designed to improved household resiliency to the ravages of drought.

A1. Program Start-up Challenges

One aspect of these structural challenges relates to a dearth of standard program-level documentation. Program start-up was complicated and slow, and the first year of implementation occurred without clearly defined program strategy, objectives or performance indicators. This relates to Africa RISING having been conceptually agreed to by USAID prior to a full design process. This situation was based on USAID having identified an important need for farming systems research, and a determination to take action immediately. At the same time, it was decided that the program should not be rushed into, and that it would benefit from a structured and deliberate start-up approach.

This context meant that although the program was funded and begun in early 2012, a design process still had to be worked through to clarify the detail of its approach. This unusual circumstance resulted in a twin-track process during Year 1. While an agreed program framework was being prepared, a parallel "quick wins" period began, whereby different CGIAR system partners, funded through Africa RISING, initiated short-term activities aimed at informing activity selection for later in the program. Impetus for farming systems analysis was built into the "quick wins" approach by insisting that such activities would be funded only if implemented jointly by a minimum of three different CG Centers.

This process helped provide insights regarding potential Africa RISING activities and also helped identify potential areas for cooperation and collaboration between different partners. It is also argued within Africa RISING that the ad hoc nature of the "quick wins" period allowed a responsive, demand driven approach to priority identification. However, the Evaluation Team is of the belief that the "quick wins" process compromised the larger program design process and efforts to achieve a high level of program coherence, with partners being left little option but to quickly identify opportunistic short-term activities often guided by the research interests and priorities of the responsible scientists. Unsurprisingly, the majority of these activities carried on into the program proper. This fast-track and relatively random approach at commencement runs counter to development of an integrated systems approach, which would benefit from a more deliberative and contemplative approach. While integrated approaches could have been crafted from these activities, the evaluation team generally observed an absence of farming systems thinking in activity selection and implementation and views the "quick wins" process as a contributing factor in this situation.

A2. Delayed Site Selection and Baseline

Delays around site selection assessment being undertaken by IFPRI also contributed to start-up challenges and delays and resulted in a cascade of consequences for the program. "Quick wins" also contributed to delayed site selection, with the "quick win" sites needing to be declared "stable" before baseline analysis would be commenced. In many instances, program communities were not declared stable until mid-2014, meaning to this day that many have had only two full growing seasons from which to garner results. Furthermore, many sites have been affected by severe drought, further compounding the impact of these delays and usability of research findings.

Delayed site selection also contributed to a delayed baseline, which was undertaken only in mid-2014, with baseline analysis only being available from May 2015 to June 2016. Given that the purpose of the baseline is to assemble all-important data from which planning, targets and performance measurement could occur, this delay denied the program a key data set from which more integrated and outcomes-focused planning could have occurred. The delayed baseline also affected development of a performance

measurement framework, meaning that decision-making around activities and implementation was undertaken without any clear agreement on specific targets being pursued within activities.

IFPRI acknowledges that another factor delaying the baseline was the considerable level of detail with which it was undertaken, based on program-wide decision-making. Although this contributed to problems in the short term, it also represented a longer-term gain for agricultural research in Africa, given that the data assembled provide a unique and detailed snapshot of Africa RISING target sites—one that has the potential to be of significant value to researchers in the short, medium and longer term.

It is also likely that the "quick wins" period compromised the baseline, given many of the locations where the program now operates received such treatments prior to the baseline being undertaken.

A3. Program Documentation

Overall, the unusual and somewhat confused start-up seems to have contributed to only a relatively limited suite of program-level documentation being assembled. To this day, Africa RISING lacks many of the key guiding documents one would expect of a large and complex program.

The program framework, more than any other document, resembles a program implementation document. It was finalized in late 2012, at the end of the "quick wins" period. However, it is not a fully formed document. With just 30 pages of relatively theoretical, conceptual discussion of the program philosophy and proposed approach, it resembles a concept note more than a program document. It also provides only very limited guidance regarding strategies to be employed to leverage and harmonize the different opportunities and learnings that would inevitably arise through the different project implementation approaches.

Africa RISING also lacks standard program-level management tools, such as a logical framework, performance indicators or a strategy for performance measurement.

This is not to suggest that the program occurs in a planning vacuum. Each project prepares annual work plans, technical reports and other documentation reflecting the work planned and undertaken. However, this situation denied both project- and country-level planning a clearly articulated and illuminating program-level strategy and implementation plan. Such documentation would have made is easier for local activities to align and be prepared in adherence with a program master plan, and in response to performance measures set out at the program level. Regardless, an overarching strategic program-level document was not prepared, and the program was effectively under implementation before a clear strategy was agreed.

While mechanisms such as the PCT aim to monitor and facilitate program-level issues and opportunities, a program plan with clearly articulated targets and performance indicators would aid program management and performance measurement at the program level.

A4. Program Complexity

As has been mentioned, Africa RISING implementation represents an ambitious and complex challenge—the level of which is seemingly not uniformly understood by all involved in its implementation. Many active in the program appear to view Africa RISING as "CGIAR business as usual," viewing it as a vehicle to support research without seeing need to manage, progress and outline pathways to development. In reality, Africa RISING is far from "business as usual" with multiple overlays of complexity demanding new and significantly adapted approaches from CGIAR system partners. More importantly, it requires astute and nuanced management to ensure all participating are working in a manner that is consistent with its program logic.

More profoundly, the program's aim to facilitate more dynamic and effective linkages between research and development communities requires significantly modified behavior and greater levels of appreciation among both of each other's value-add. Similarly, a more active, hands-on role in achieving development outcomes involves a steep learning curve for those whose professional experience has primarily focused on high quality research. Improving relationships between researchers and development workers requires attaining trust, appreciation and confidence that investing in more collaborative relationships will add value to development programming. These are significant challenges that require hands-on change and relationship management if program outcomes are to be achieved. Effective communications approaches and dissemination of results also require multi-faceted approaches that are responsive to the needs of an array of potentially acutely different target audiences.

Another key challenge is presented by an implementation approach based on community-based, on-farm trials. This challenge is compounded by the program's staffing model (and capacity) which means that CGIAR system researchers are commonly not on site, with many being able to visit sites only two or three times per year. Such a research approach demands confidence in partner capacity and, inevitably, more sophisticated approaches to capacity building than were evident to the evaluation team. It is also vital that partners are intimately familiar with the program approach and philosophy, heightening the importance of a clearly articulated program design document, objectives and supporting program literature.

Implementing a program capable of addressing gender differences in a sophisticated and results-oriented manner is another layer of complexity requiring time and capacity that has not been regarded as an area of comparative advantage of the CGIAR system. Similarly, community engagement, mobilization and participatory planning processes are becoming more recognized within the development sector as requiring finely tuned technical skills—skills that are not commonly associated with the CGIAR system.

The net result of the above factors is that Africa RISING represents a highly complex partnering challenge. It requires development practitioners, civil society, academia (which often lacks resources), government partners, local researchers *and* communities to work harmoniously toward common objectives in a context where program documentation and direction has been relatively light and lacking in detail. While R4D Platforms are proposed as a gathering point for different parties, they were often observed to exist in name only. In Ethiopia, where the program has invested more heavily in site-level management capacity, R4D Platforms are far more advanced, suggesting local program capacity as being key to any future phase better addressing the program's partnering challenge.

Within such a context, astute relationship management is imperative, as is sufficient time to nurture the relationships that bind the program's research and development objectives. A key observation of the evaluation team is that the challenges and time required to identify, establish and consolidate partner relationships has been underestimated. This can be demonstrated by progress to date along Africa RISING's program logic, which is a continuum aiming to carry research to development. Currently, the program remains primarily positioned at the front end of that continuum, conducting research trials to validate technologies. In reality, dissemination of validated technologies throughout the development landscape is only just beginning and R4D Platforms are relatively new and generally reflect a lack of sophistication in terms of relationship management, inclusion and mobilization.

A5. Program Monitoring

The program's slow start up and structural weaknesses are also reflected in uncertainty related to program monitoring. This uncertainty relates to both inadequately defined program-level performance measurement indicators and also responsibility for monitoring. While IFPRI was charged with program monitoring, their on-the-ground capacity was limited outside the survey period. As mentioned above, the program baseline proved to be a complex and time-consuming exercise that was significantly

delayed. Development of a decentralized, online system for monitoring also took time to develop and did not become available until 2014. Those who use the system are only now becoming familiar with its technical requirements.

This situation was further complicated by a lack of clarity around roles, responsibilities and focus of monitoring needed at the project level, with implementing partners awaiting direction from IFPRI. This uncertainty was belatedly resolved to an extent by different projects appointing M&E personnel to monitor local activities. Overall, monitoring is compromised by a lack of consistent performance indicators, contributing to having no consistent monitoring approach or formal framework linking the results of each project to the program as a whole. As a result, the program is poorly positioned to describe, define and quantify its impact across the totality of its activities. This denies Africa RISING the possibility of fully advocating the case for being effective in sustainably intensifying smallholder farming systems in a manner that reduces poverty and positively affects nutrition.

A6. Africa RISING-Mission Relations

Implicit within Africa RISING's theory of change is an expectation that dynamic, mutually advantageous and complementary relations can be established between the program and USAID country Missions, other FTF-funded projects, and local agriculture actors. Given FTF's philosophy, all of its programs should be responsive to and working in a coordinated manner toward:

- Increasing agricultural productivity and generating opportunities for economic growth and trade in developing countries
- Boosting the productivity and incomes of rural smallholder farmers, who are the key to unlocking agricultural growth and transforming economies
- Improving agricultural research and development and get existing, proven technologies to more people
- Increasing resilience to prevent recurrent crises and help communities better withstand and bounce back from crises when they do happen

Within that construct, Africa RISING enjoys comparative advantage in agricultural research, while FTF-funded development programs bring high-quality skills in key areas such as value chain development and promotion, nutrition, communications and gender. Despite potential synergies and symbiotic relationships, only limited meaningful collaboration between Africa RISING and FTF programs is evident. There has also in several countries been insufficient engagement by the program of local Missions, denying all parties the opportunity to fulfill the potential of FTF at the country level. One exception is the FTF-funded NAFAKA program in Tanzania, where Africa RISING has achieved a strong degree of alignment and complementarity, resulting in the potential for technologies promoted by Africa RISING to be scaled out well beyond program target communities. In Malawi, based on the first 4 years of results from Africa RISING, USAID Malawi has provided $4.5 million over 3 years to support Africa RISING to expand research and development activities, including shifting livestock activities from dairy to small ruminants and poultry. In Zambia, the Mission has expanded their support of Africa RISING with an additional $600,000 for research and scaling activities in eastern Zambia. But more generally, it appeared that Africa RISING's relationships with Missions was limited and lacking strategy and attention.

Complex reasons contribute to the lack of progress in leveraging these potential relationships. One reason for this might be that responsibility for program oversight lies in Washington, D.C. USAID Mission-based staff are aware that Africa RISING exists, but they have no actual responsibility or accountability to advance the program or nurture relationships with other FTF projects. Given workload pressures, this inevitably relegates Africa RISING to a lower priority for staff than other programs where they have a direct oversight role. It also seems common for Africa RISING to not be included in Mission-facilitated country planning meetings.

Consideration of a realistic and explicit strategy to better integrate Africa RISING within day-to-day country-level programming of the Mission could facilitate the symbiotic relationship with FTF-funded development programs implied within Africa RISING's approach. Such strategies should facilitate more outcomes for FTF, similar to the "win-win" achieved in Tanzania through Africa RISING's relationship with NAFAKA.

Successful scaling: Africa RISING – NAFAKA relations

Africa RISING's relationship with NAFAKA stands out as an important scaling success story achieved through different parties identifying mutually advantageous terms of engagement through which significant scaling could occur. The goal of the relationship was to accelerate the scaling and delivery of agricultural technologies to improve smallholder maize-farming systems, household nutrition, and dietary practices in Tanzania. This win-win situation appears to have been achieved through open and honest dialogue that accepted that each party had strengths and weaknesses, and that by playing to each other's strengths, each party stood to benefit. This dialogue allowed an agreed approach and mandate for the partnership to be reached, with roles and responsibilities clearly articulated and agreed upon. Key to moving the relationship from talk to action was the allocation of resources to ensure staff were specifically available to work through and move partnership actions forward. Significantly, both parties spoke of the importance of viewing each other as equal partners, recognizing that each brought a unique "value add" to the relationship. Constant review of progress was also seen as important, as was a willingness to end non-functional and non-productive partnerships. In addition, personalities and timing were seen as integral, as was active encouragement from the USAID Mission in Dar Es Salaam.

B. Africa RISING's Conceptual Underpinnings

Central to the complexity and challenge of Africa RISING is the integrated, multi-faceted and multi-stakeholder nature of sustainable intensification. This section discusses the components that are generally considered to be critical aspects of sustainable intensification to consider the degree to which Africa RISING's current approach is sufficiently holistic to achieve its ambitions. It also summarizes the degree to which elements of sustainable intensification are being actioned. Sub-sections C and D below provide more detailed analysis of program performance in a discussion of research and development objectives.

B1. Conceptual Framework

Africa RISING's program framework, prepared in 2012, outlines the program's guiding principles and conceptual framework at a relatively theoretical level. While it provides important intellectual guidance to implementing partners, strict adherence to the framework is inevitably challenging at site level due to realities on the ground that need to be managed during implementation. In order to assist local practitioners to make sense of the complex and challenging implementation framework, emphasis is placed on the need for "stepwise progress toward sustainable intensification," recognizing that:

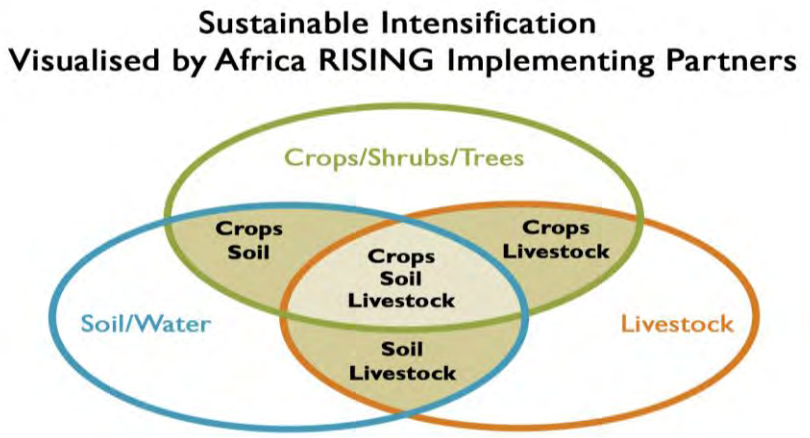
> "Ultimate intensification requires the adoption of various SI innovation components, each with their own challenges, towards large-scale uptake. It has been demonstrated that farmers hardly ever take on simultaneously a suite of alternative or improved practices. Africa RISING acknowledges this and will evaluate the 'robustness' and 'riskiness' of specific interventions aiming at intensification and will then develop pathways to integrate more components as households move up the intensification ladder."[3]

[3] Africa RISING Program Framework 2012, p. 7.

Program staff emphasized the principle of "stepwise progress towards sustainable intensification," especially in situations where longer implementation periods are needed before credible data can be generated, and that the balance will not be concurrent at every point of time in the project implementation period.

In meetings with each project, similar though varying versions of the Venn diagram in Exhibit 5 were presented as being a simple, yet important guiding concept for implementation. Key decision-makers stressed that work should be undertaken across all three areas and within all three intersections, and were determined to identify options that reflect the center of the diagram: sustainable intensification.

Exhibit. 5. Achieving Sustainable Intensification



The logic underpinning pursuit of sustainable intensification as a poverty-relieving strategy is reflected in Africa RISING's program purpose: *to provide pathways out of hunger and poverty for smallholder families through sustainably intensified farming systems that sufficiently improve food, nutrition and income security, particularly for women and children, and conserve or enhance the natural resource base.*

A guiding principle of the program framework is reflected in a clear statement that the focal domain for Africa RISING's investments and activities is the farm household, given that this is the scale at which household production decisions, gender and nutrition issues, household welfare, soil health and productivity issues operate.[4] This includes clear emphasis on the importance for Africa RISING of nutritional outcomes, an active role for women, and understanding and engagement of market issues.

Across all program countries, trials have begun that work to highlight the positive intersection of crops and soils. These mostly revolve around improved seed varieties and intercropping or rotation of legumes to enhance soil fertility through systems of mother and baby trials. While these relatively one-dimensional approaches have proven to be mostly successful and very popular among participants, they consume a large portion of the program's resources and energy. This affects the program's capacity for more holistic and diversified consideration of sustainable intensification options. In particular, livestock programming is limited. While there has been significant emphasis placed on soil health through crop rotations and intercropping of legumes, there has been only limited concentration on addressing other

[4] Africa RISING Program Framework 2012, p. 6.

strategies for promotion of soil health, such as erosion control, composting and better use of livestock waste. In Ethiopia, testing of blended fertilizers and organic resources in the Ethiopia project has been high quality and is contributing to the fine tuning of national recommendations.

Although limited resources undoubtedly restrict Africa RISING, there is a concern that the full breadth of sustainable intensification and its requisite interactions cannot be sufficiently progressed as a concept without adequate consideration of all its potential parts and synergies. The following sub-sections discuss some of these elements to assess progress toward achieving the program purpose.

Supporting Homestead Farming Systems

Dotted across Africa RISING programming in Ethiopia were examples of support being provided to visionary farmers for their homestead production systems. Identified by site coordinators through their start-up work in the various kebeles where the program is operational, these mostly women farmers were supported opportunistically, both with knowledge but also with small resource grants, to further develop their homestead gardens and livestock as "model homesteads." In return for the program's investment, other community members could visit, learn and be given inspiration to adopt similar practices. While the impact of program investments in such households appears to the eye to be significant, this is difficult to quantify, since no homestead production-focused research is occurring.

B2. Role of Homestead Production in Sustainable Intensification Options

Despite frequent references within the program framework to the importance of the homestead in sustainable intensification of smallholder farming systems, the evaluation team observed only limited focus on what smallholder farmers do within their homesteads, where they live and keep their animals. Throughout the evaluation, visits to farmers' homes highlighted that in almost all cases faltering efforts are being made by farmers to augment diets and incomes through a small garden, fruit trees, composting, poultry and small ruminants. Commonly, farmers' management of homestead-based production is characterized by poor management and missed opportunities. This is, therefore, a prime candidate for technical support and trials. While Africa RISING pursues some homestead-based initiatives in some locations, it is not occurring in an integrated manner to maximize the potential of homestead production. Poultry production, vegetables or fruit trees occur in isolation, without consideration of the potential role of other opportunities within that unique homestead system being considered or operationalized.

Homestead assets and needs are traditionally a woman's responsibility. Consequently, their enhancement presents a unique opportunity for addressing women's empowerment and child health and nutrition issues. These responsibilities often include care for (smaller) livestock, storage of food and seeds, water collection, cooking, collection of firewood, compost management and tending to a home garden. Without exception, every smallholder homestead visited during the evaluation had piles of organic matter distributed around it (e.g., manure, plant matter, kitchen scraps or crop residues). Yet, very few had received guidance on how best to utilize this organic matter to the betterment of other production efforts. Integrated within these responsibilities is the all-important responsibility of childcare—and educating youth on the benefits of good homestead farming system management.

Despite the conceptual framework driving Africa RISING, the limited research that does occur at the homestead production level occurs in relative isolation, with seemingly no overarching advice on how to best support interactions between Africa RISING's investment and the broader production system in play within individual homesteads. Isolated examples in Ethiopia and Mali highlighted the potential of more holistic, homestead system support and its capacity to help secure livelihoods and food and nutrition security.

Investments in dairy did not raise awareness or develop skills in relation to the potential value of the manure byproduct being produced. Poultry production trials were commonly based on procurement of commercial feed, even when the local environment presented many feeding options. Many poultry initiatives failed to promote the nutritional value of eggs and meat. Vegetable production was often narrowly focused around provision of seed and inorganic fertilizers, with no support to consider other aspects or opportunities related to vegetable production (e.g., mulching, water management or use of composts or local manures). Nutrition awareness seemed to rarely be integrated within vegetable production.

The smallholder homestead has the potential to be a learning lab, consistent with Africa RISING's sustainable intensification and gender focus. It has the potential to educate family, friends, neighbors, Africa RISING and its development partners. It has the potential to be a point of empowerment for women and children. All three circles in Exhibit 5 are there—crops, soils, livestock—and the household's homestead is the intersect. However, such approaches would require a more truly farming systems approach that takes the time to fully understand levels of knowledge and assets available to a household. Such approaches were partially observed in Ethiopia, where Africa RISING identified visionary farmers, providing targeted support that further complemented their farming system.

In Ethiopia, significant support has been provided to homestead production. Here, in Jawa kebele, Africa RISING supported a teacher and her family with vegetable seeds, fruit trees and technical advice to increase the productivity of her homestead farming system as a community demonstration. The smallholders spoke proudly of being able to sustainably intensify the use of their homestead's assets and resources, and the family's increased farm income to put all of their children through university. Her husband spoke of them now being more resilient to climatic shocks. *Photo credit: Scott Rankin*

B3. Livestock Programming in Sustainable Intensification Options

Unlike cereal crops and legumes, livestock (including meat and eggs) are an important nutrition investment, given their importance as a source of dense nutrients. Because these nutrients are of particular benefit to pregnant and nursing mothers, and children, they are directly relevant to Africa RISING's purpose. Livestock in the household is also commonly of direct benefit to women, youth and family nutrition. As a general rule in Africa, women do not move in agro-pastoral systems, but rather remain with the small livestock and the lactating cows and calves at the permanent residence. Common practice is for men to not co-opt benefits of livestock cared for by women. While men may co-opt the sale of livestock, even in this circumstance women will generally still get a portion of the funds for household use. Women also reliably get livestock products into the household diet.

While most households in the target area manage some kind of livestock (mostly in the homestead), the evaluation team found Africa RISING's livestock programming to be limited in scope, despite it being stated as a priority for investment by every community visited. This is difficult to explain given the much-promoted Africa RISING Venn diagram and the many synergies that could emerge from livestock research under integrated sustainable intensification, nutrition and gender empowerment.

Communities' perspectives on livestock needs and opportunities were relatively common across the five countries visited. Support to improve disease management was raised constantly. Improving productivity through bloodline improvements was also frequently raised as a priority, as was supporting poorer farmers into livestock ownership through cow banks and other offspring sharing mechanisms.

Currently, true integration of animals within a systems research approach is rare within Africa RISING. This is despite the CGIAR system's official center of livestock expertise, International Livestock Research Institute (ILRI), being a leading partner in the program, a participant on the Program Steering Committee and the lead agency for the Ethiopia project. Cost is one inhibiting factor, as is the perception that results cannot be quickly achieved in many aspects of livestock production.

Across the five visited countries, there seems to be little that connects the livestock initiatives at the program level, whether the focus was cattle, small ruminants or poultry. One exception would be the planting of nitrogen-fixing fodder trees; but even there, there is little evidence of knowledge sharing at the program level. Each of these issues present researchable questions.

Africa RISING management cite resources as the key constraining issue. Livestock programming is perceived as expensive and complex, and also discordant with the heavy focus placed on crop systems by other CG Centers. Improving bloodlines and introducing new breeds is seen as time consuming and beyond the scope of a program such as Africa RISING. While this is potentially true, potential alliances exist that would greatly value the expertise that a center such as ILRI could bring to their efforts.

While disparate in nature, the animal portions of the livestock program as it stands focus primarily on small ruminants and poultry. Direct work with dairy cows was not evident except during a visit to feeding trials at a milk collection center in Malawi. More common ground exists across fodder trials, including the use of labor-saving equipment such as choppers. Improved feed bins and systems for fodder storage have also been rolled out through the program. However, there is little clearly focused research or results emerging from such interventions. For example, trials around feed storage tend to focus on just the one storage option, rather than comparing different options using lower cost materials. Commonly, storage facilities were made from expensive materials, including zinc sheeting. While these structures were appreciated by farmers, there was no sign of adoption in the broader community, nor any capacity to quantify savings and therefore present a cogent argument as to why these elaborate storage structures might be a worthwhile investment.

Of the livestock research that is occurring, there are concerns regarding the validity of some of the areas of focus. For example, in Ghana commercial feeds are distributed free of charge as part of "fattening" research in a context where fodder affordability is *the* key constraint. In poultry programs in Ethiopia, research occurs around trials reliant on commercial feeds in a context where options exist for feed to be produced within the homestead. More generally, livestock programming is geared across all countries toward the wealthiest cohort within the community, with the approaches often not relevant to the majority of the community. Dairy programming in Malawi is such an example, given that fewer than 5 percent of households own cattle.

As will be discussed in more detail below, nutrition awareness-raising was at best sporadic across the villages visited. Promotion of the nutritional benefits of meat and eggs was not observed at all, despite one serving of these foods being equivalent to the daily recommended amounts of iron, protein and other nutrients.

There are also important potential interplays among cropping, soils and livestock that are not being fully exploited. For example, cereal-legume intercropping has the potential to benefit livestock through processing the vegetative matter into fodder. However, consideration of post-harvest handling of legumes for fodder is limited. In field visits to all countries, groundnut foliage was found in the field, not gathered and dried, with little appreciation of its potential value as fodder or organic matter to be sewn back into the soil.

Conflict resolution and sustainable intensification?

In Koutiala, Mali, Africa RISING is greatly appreciated for work it has undertaken in relation to resolving age old issues related to historic cattle corridors running through the community of Sirakele. Support has been provided to develop a sophisticated set of natural resource management guidelines for the community, in an attempt to resolve disputes arising from cattle passing through the community en route to markets in neighboring countries. This well organized and dynamic community spoke proudly of how the regulations were reducing conflict, preventing crop losses, improving natural resource management, and contributing to improved livestock management given regulations and penalties now apply for untethered animals. While greatly valued, the investment does not sit neatly within the broader Africa RISING remit for scientific research related to sustainable intensification, therefore raising an interesting question of the "sustainable intensification perimeter" within which Africa RISING should focus its investments.

While not scientific research *per se*, program efforts to resolve problems emerging from historic cattle corridors in Koutiala were greatly valued by the community and could be transferrable to other locations. However, it is difficult to see the relevance of such research to sustainable intensification and Africa RISING's mandate, no matter how appreciated the intervention might be.

B4. Incorporating Nutrition

Nutrition outcomes are explicitly stated in the program purpose and Africa RISING's research and development objectives. While the program is almost certainly having a nutritional impact among the participating cohort by virtue of increased and diversified agricultural production being achieved through cropping trials, few activities are deliberately focused on raising awareness of nutritional issues or measuring the nutritional impact brought about by improved agricultural practices.

More generally, local-level program monitoring does not capture data relevant to nutrition. Where it does, it can be of vital importance. In northern Ghana, work by university-based scientists on the individual variation in nutrition was highly informative on the determinants of malnutrition in the intervention communities. Lack of monitoring and evidence of the program's impact on nutrition is a

missed opportunity. A strong evidence base linking sustainable intensification approaches to improved nutritional outcomes would be a major hook for Africa RISING to use in its scaling efforts.

Although the program's development partners have been sporadically engaged in nutrition, Africa RISING is mostly reliant on linkages with existing government nutrition programs. This leaves the program vulnerable to the vagaries of extension systems. However, when development partners have been engaged, they have been effective in raising awareness of nutrition, especially the value of soya and other legumes as a protein substitute. Where specific investment in nutrition has occurred, strong results have followed. In Mali, an NGO has been subcontracted to provide nutrition support that is complementary to the agricultural trials being undertaken. Their more overt emphasis on nutrition education and building of community capacity contributed to both awareness and action in terms of improving diets of children and mothers.

Conversely, there were cases observed where soya production was being trialed within a community, but where women were unaware of its nutritional value and had ceased production "because there wasn't a market." While the program logic is very much about promoting synergies, those related to nutrition are not being maximized, even though it is almost certainly a good story waiting to be told.

In Tanzania, for example, a logical partnership would be with USAID's Mwanza Bora project, which addresses woman and child nutrition through its 1,000 Day program. More broadly, USAID, through FTF, funds specific nutrition-focused activities in each Africa RISING country, presenting opportunities for mutually advantageous collaboration.

Currently, Africa RISING does not have simple research (or monitoring) protocols in place to assess whether nutrition education translates into improved dietary intakes and anthropomorphic outcomes for young children and their mothers. Africa RISING does not necessarily need to undertake such measurements—they could be done through strategically identified relationships with development partners, especially given USAID investment in nutrition in the target area.

B5. Ensuring High-Quality Gender Performance and Inclusion

Explicit within Africa RISING's overall objective is an ambition to specifically address well-being issues among women and children in smallholder farming families. Significant effort has gone into ensuring women's participation in Africa RISING trials, with numbers generally ranging from one-third to one-half at target sites.

Although women participate and receive the same benefits as men, there is evidence of irregular performance in terms of how women are engaged and participate in the program, with approaches rarely being gendered. As a result, women often lack the same levels of awareness of the "why and how" of their trial, based on capacity building approaches that are designed with men in mind. In Ethiopia, where deliberate investment has occurred in supporting women's understanding of technologies, evidence of adoption by women more broadly can be seen. It is also noted that Ethiopia was the first project to appoint a gender advisor.

There is also limited flexibility of approach in terms of research adapting and having sufficient nuance to respond to the different contexts of men and women. For example, men commonly assume responsibility for the household's better-quality land, leaving women on more marginal soils, a situation that requires tailored approaches. Based on participation in community meetings, it was also observed that it is primarily older women who are active in trials, with very limited participation by the younger women who will be so central to achieving sustainable intensification for the next generation.

In late 2015, Africa RISING initiated a gender capacity assessment across its West, East and Southern Africa projects, led by the gender advisor recruited by IITA earlier in 2015. Implicit in the assessment was recognition that Africa RISING needed to direct more attention toward the importance of gender if it was to achieve its objectives. The study was, in effect, a belated gender baseline study from which strategy and future performance can be measured.

Africa RISING management recognized gender analysis (including the use of its results for research programming) and the application of gender transformative approaches as areas in which efforts should be increased. However, skills, knowledge and experience of gender analysis and gender transformative approaches are limited among research staff, and there is a general lack of confidence among staff in mainstreaming gender in the program. Staff are also uncertain of their roles and responsibilities in addressing gender issues. The evaluation team feels that these conclusions are a valid and honest reflection of the program's current context and future needs.

In terms of the program's research focus, there is disproportionate investment in supporting women's specific areas of interest, which include small ruminants, poultry and dry season vegetable production. In areas where nutrition activities have been integrated within agricultural activities, women were observed to be more active and aware of the benefits of the technology under trial, and also demonstrated more active participation and ownership of the program.

B6. Addressing Climate Change Issues

Africa RISING has initiated many adaptive actions, with the primary entry point for consideration of climate change being the introduction of early and very early maturing varieties, valued for their capacity to reduce risk to increasingly irregular weather systems. Africa RISING also promotes diversification through climate-smart intercropping of legumes and cereals. Improved water management and erosion control are other initiatives commenced through the program in response to worsening droughts and floods. Climate change is not explicitly mentioned within the program framework, leading to a non-systematic approach to climate change adaptation activities.

Participants value these strategies, but still voiced much concern about changing weather systems and sought support from Africa RISING to better adapt. For example, people want to shift composition of their herds toward small ruminants, in large part because of their capacity to better survive drought and rebuild herds faster. Improved water management and erosion control are other needs voiced by communities through a climate change lens.

Given the extraordinary and ever-increasing amount of resources available to support activities relevant to climate change, it would also be strategic for Africa RISING to more explicitly measure and articulate its climate adaptation and resilience capacity, focus and results.

B7. Role of Youth in Africa RISING

The program does not have a strategy for supporting youth in agriculture. However, the evaluation team views this as a very real, though complex, need. The team also observed that the program name suggests a role for youth, given Africa RISING's mandate to conduct research into sustainable intensification for the next generation.

Currently, there is almost no engagement of youth within the program. Africa RISING's self-selection approach to participation inevitably draws in more capable, experienced (and almost universally older) farmers as trial participants, with the expectation that knowledge and changed practice will trickle down to younger, less capable farmers.

This challenge of including youth is compounded by community elders positioning themselves at the front of the line in order to access the various inputs on offer, and made more complex by land ownership and fragmentation issues that make it difficult for youth to see a future in agriculture.

IITA currently implements a Youth Agripreneurs strategy aimed at harnessing the energy of youth to engage in agribusiness in Sub-Saharan Africa. Engagement by Africa RISING of such a program would be logical and potentially mutually beneficial.

While there is no doubt that inclusion of youth is complex and a major challenge on multiple fronts, the evaluation team feels that many benefits could emerge for the program through their greater inclusion. Most obviously, the participation of young mothers has the potential to fundamentally shift understanding of nutrition and production for this generation and those to come. There is also a social imperative in identification of opportunities for young men to be gainfully and productively employed. In many instances, they are better educated and more actively engaged with the modern economy, potentially having a role to play in transforming the agricultural economy.

B8. Market Awareness, Analysis and Action

Central to every aspect of Africa RISING's program logic is the urgent need for a better functioning agricultural marketplace, both as a point for accessing much-needed inputs and for sale of produce. This belief is shared by many development actors, and is also integrated within other FTF-funded activities.

Resolving deeply flawed market systems is beyond the scope of Africa RISING. However, it is critical that market issues of fundamental relevance to the viability and adoptability of trials being rolled out are adequately addressed. Overall, marketing issues have been given insufficient attention within individual trials or sites. In many instances, improved seed varieties being trialed were not available for purchase in local marketplaces, meaning that chances of adoption were next to zero. In other cases, farmers were accepting farm gate prices from middlemen for trialed crops far below market value at nearby markets, rendering the value of the trial uncertain.

Missed opportunities for maximizing benefits and profitability affect the adoption potential of technologies that have proven in trials to be effective. Identification of strategic partners to address such constraints is vital—and probably mutually advantageous.

B9. High-Quality Community Engagement

Africa RISING's model of in-community, on-farm trials demands high-quality community engagement that is inclusive, transparent, gender-inclusive and capable of disseminating information effectively. Without such engagement, awareness of broader community opportunities and constraints will not be adequately understood. This will undermine efforts to promote broader adoption of technologies and reduce opportunities for development initiatives to emerge from them.

The engagement practice of Africa RISING is observed as being "light touch" and prone to "elite capture," with community leaders positioning themselves to be program beneficiaries. Although leaders often achieve that position because of their farming acumen, it is important that Africa RISING interventions are relevant and have the potential for uptake by the majority of households in a target community. Too often the evaluation team observed trials that were relevant only to those households that were already very well resourced. For example, expensive solar pumps were being trialed in Ethiopia in communities where 80 percent of households had failed to access ground water when digging wells. Similar examples exist across all countries.

IFPRI expressed concern at elite capture, having observed during the baseline process that Africa RISING is primarily working with the wealthiest and best-resourced cohort in communities. This raises

questions around equity. It is also important that the program work with average and poorer households if the appropriateness of technologies is to be truly tested. Generally, IFPRI had difficulties in measuring program effect because the criteria for choosing beneficiaries was not clearly stated. For Phase 2 the criteria for selection (both village and farmers) should be transparent and explicit.

B10. Site and Beneficiary Selection

The selection of sub-regions and research action and control sites was systematically carried out, involving several steps. Action sites were chosen by CGIAR Centers working with local stakeholders, with IFPRI undertaking work to characterize each. Control communities were then selected by IFPRI to be as similar to action sites as possible. A complex range of factors informed final selection, including agro-ecological potential, market access and population density, overlaid by partners' site priorities and the interest of selected communities to participate. As discussed earlier, site selection was delayed, but the dual criteria of length of the growing season and market access were effectively used to identify benchmark sites that were representative of broad domains in the FTF zone of influence in each country. Biophysical variables for stratification were as follows:

- Malawi: elevation and temperature-adjusted rainfall
- Ethiopia: population, rainfall, elevation (together with market access, livestock density and wheat growing potential)
- Tanzania: rainfall, elevation, slope
- Mali/Ghana: population, elevation, rainfall and farming systems (with some consideration of market access)

The evaluation team visited close to half of the program's 84 action research sites, and observed that they represented a good mix of production potential and market access in each of the five countries.

Program beneficiaries are self-selected with it being common in most sites for demand outstripping availability, meaning that many who want to participate are unable to. This is observed as contributing to a bias in research toward more empowered, better resourced households. While this can potentially contribute to the reliability of a trial in terms of the farmer being better equipped with time and resources to support trials, it is also the case that some trials occur within household contexts that are atypical of that community, and therefore of little relevance to the broader community.

In particular, younger people are barely visible in program trials despite the program's commitment to working with and empowering the "next generation."

C. Findings Related to Research Objectives

It is the opinion of the evaluation team that the complexity and ambition of Africa RISING made it unlikely from the outset that its R4D objectives could be fully achieved in one phase. This is only a criticism in the sense that it was not openly acknowledged, meaning that longer term planning was not apparent. This situation was reinforced by USAID being unable to commit to a second phase.

Start-up delays and other implementation challenges made full achievement of program objectives even more unlikely. This context contributes to the current situation, in which the program remains primarily positioned at the front end of its research to development continuum, conducting research trials to validate technologies with dissemination and scaling up of validated technologies throughout the development landscape only just beginning. Therefore, the findings section that follows will devote more space to analysis of the research

objectives, in order to ensure thorough understanding of Africa RISING's areas of focus and performance in Phase 1.

C1. Research Objective 1

Identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability

The focus of the first research objective relates to validation of promising technological options for sustainable intensification. From an evaluation perspective, it requires exploration of the degree to which these options are demand-driven and ready for adoption outside support from Africa RISING. Obtaining satisfactory outcomes for this objective in terms of contextually validated technologies is in many respects a prerequisite for progression to the other research and development objectives. Without success in this research objective, Africa RISING effectively has no information to share and no development outcomes to be pursued.

C1a. "Quick wins" in pursuit of "demand-driven" research?

Within Africa RISING's research-for-development landscape are different options for defining "demand-driven." Certainly, responsiveness to the demands of farming communities is implied in all program literature and is an objective of all stakeholders.

Africa RISING's program framework describes three drivers for identification of demand-driven entry points: situation analysis, implementation based on the ex ante potential of certain interventions and technologies, and agreement between partners constituting the R4D Platforms. Entry points can also include innovations related to social and institutional arrangements, eventually in combination with specific technology components.[5] The "quick wins" year initiated at program outset was designed to help identify and inform "demand driven" programming.

Situation analysis

Situation analysis and program-wide synthesis form one of Africa RISING's four research outputs, with the aim of ensuring identification of best-bet or best-fit interventions that align with priority constraints in target areas. Situation analysis is also designed to support program-level synthesis of lessons learned from across the program's target areas.

Mostly occurring during 2012 and 2013, this analysis is locally relevant with detailed consideration of options for farming systems analysis in target areas. However, the process was also time-consuming, contributing to the program not progressing as far as anticipated. As one site coordinator candidly commented, "The first two years were effectively wasted," referring to the program's heavy, early focus on situational analysis. In the same discussion, this person spoke of his excitement at the thought of a Phase 2, because "We'll be able to hit the ground running this time."

Support to the process of situational analysis from Michigan State University and Wageningen University, each with a long history of agricultural research in Africa, was well-considered and valuable in terms of bringing alternate perspectives to this important exercise. "Quick win" projects undertaken during 2012 were also informative in terms of situational analysis and opportunities for program synthesis.

Research on the identification of constraints and opportunities in Phase 1 highlighted a broad range of options relevant to sustainable intensification. Identification of community research priorities was common in each country; others were specifically designed to shed light on doctorate-level research in a

[5] Africa RISING Program Framework (2012), p. 9.

sub-region. The results of this work can be found in many publications available on the program website, though the degree to which this valuable information has been adequately leveraged to progress the Africa RISING development agenda is questionable. (This is discussed later in the report.)

Although a broad range of potential interventions relevant to systems analysis were identified during the "quick wins" period, the breadth of learning achieved through the situational analysis was not often reflected in a sufficiently integrated form in the suite of activities that followed. Given the situational analysis aimed to identify "demand driven" research, the lack of follow through on findings is concerning.

Implementation based on the ex ante potential of certain interventions and technologies
Although consideration of ex ante potential of interventions and technologies is an ongoing program approach, it was arguably most critical around start-up, because that is when the broad parameters of the program direction in each site were established. "Quick wins" activities were critical for clarifying the ex ante potential of sustainable intensification options. However, as the phrase suggests, "quick win" investments were identified hastily and opportunistically soon after USAID confirmed Africa RISING would proceed. These investments, when considered in total, were not holistic in their analysis of potential sustainable intensification options, and often were unresponsive to the demands articulated by communities to the evaluation team, and conversely were responsive to the specific research interest of participating researchers.

Agreement between partners constituting the R4D Platforms
Although R4D Platforms have the potential to play an important role in informing and validating Africa RISING's research agenda, they are for the most part still in the process of establishing themselves, structurally weak and in need of being more inclusive of local development actors. Currently, the majority of R4D Platforms enjoy only token participation beyond the local agriculture department and farmer representatives selected from within the Africa RISING beneficiary cohort. Given this context, they are poorly positioned to identify or clarify demand-driven options for Africa RISING to pursue, nor can they cultivate the alliances necessary to achieve the program's scaling options.

While the approach outlined in the program framework for ensuring demand-driven entry points is logical, some aspects of this logic are not yet sufficiently strong or inclusive to fully justify the claim of demand-driven programming. While consideration of the ex ante potential of interventions is important, it does not equate to demand-driven programming unless local mechanisms are in place to validate proposed interventions. Currently, the majority of R4D Platforms are insufficiently representative of the local research and development community to support demand-driven programming in more than a token way. Exceptions exist in Malawi and Ethiopia, where significant effort has gone into aligning R4D Platforms with existing structures in a manner that complements and expands their capacity. In Malawi, local university-based researchers are (in theory) required to present findings to R4D Platforms for scrutiny, discussion and subsequent action. In Ethiopia, locally based AR managers are active in building a sense of common purpose within R4D Platforms that aims to ensure coordinated effort among local agricultural departments, universities and local civil society.

Despite this, Africa RISING *is* responding to important issues being articulated by smallholders. Clearly, farmers value the program's heavy focus on maize, given its importance to core livelihoods approaches in almost all of the target areas. What is more difficult to assess is whether Africa RISING's portfolio of activities in its target areas fully reflect communities' actual priorities within the full spectrum of sustainable intensification, or whether they more reflect the priorities of CGIAR system partners and researchers wanting to test their ideas in the field. Accurately measuring the veracity of this assertion is difficult due to the diverse priorities and opportunities inherent in each community and limited resources available to the program. Clearly, it is impossible for Africa RISING to respond to all needs.

However, the near total absence of programming in rice, despite it being an FTF focus crop in Tanzania, Mali and Ghana, is notable in many areas. Limited programming in livestock is another area where community priorities have not been followed through. Almost no programming in sunflower and very limited work in relation to homestead production suggests that the program often fails to respond to community priorities and those emerging through R4D Platforms. Furthermore, over-concentration of efforts on cropping is unbalancing and potentially restricting Africa RISING from more fully exploring synergies and opportunities for integrated approaches inherent in sustainable intensification.

Another stakeholder group with potential research demands are other FTF-funded projects. However, limited engagement or collaboration by Africa RISING with these projects contributes to a situation in which their priorities are only superficially understood. It has also contributed to duplicate research. For example, in northern Ghana, both Africa RISING and the Agriculture Technology Transfer (ATT) project undertake field trials related to improved maize seed varieties, yet no collaboration or information sharing occurs. In this same example, Africa RISING experienced issues related to ensuring communities had access to the improved seed varieties being used in trials, despite ATT having seed production and input access as core components of its program.

Africa RISING and ATT's respective comparative advantage needs to be better explored, managed and leveraged to ensure complementarity and maximum value is achieved from these related FTF investments. Missions also have a role in drawing such synergies together, given their overview role of all FTF investments in a country. Similar examples of disconnect between Africa RISING and potential FTF-funded partners could be articulated in all five countries the evaluation team visited.

The manner in which trials have been implemented also presents difficulties in determining the degree to which they are demand-driven:

- ***Input bias.*** In order to ensure the scientific integrity of trials, Africa RISING commonly provides all necessary inputs, meaning that farmers carry little risk, even in farm-based baby trials. Participating farmers, therefore, enjoy the incentive of free and straightforward access to high-quality inputs they would usually buy, and also to high-level, farm-based technical assistance (from program staff). Input access was also observed to be a constraint to knowledge sharing in some communities, where program participants were clearly very keen to restrict participation and knowledge dissemination in order to preserve their access to inputs.
- ***Market access and availability.*** In many program locations, improved seed varieties and other inputs being trialed within a technology were difficult to access locally. In some cases they were simply not available, denying opportunities for adoption even when demand did exist. Expectations that R4D Platforms would be a point of engagement between farmers and the private sector have not yet come to fruition.
- ***Workload issues.*** There is limited consideration of workload issues and impacts related to new technologies. This is particularly relevant for women, who are already very busy performing many important functions.
- ***Women's participation.*** While the program is making efforts to ensure women's voice and participation, there is little evidence it is addressing women's specific priorities. Questions also exist over the degree to which women have been provided sufficient knowledge and capacity building opportunities to independently adopt new technologies. Over the course of the evaluation, women were far less capable of explaining the purpose, relevance and benefits of new technologies than men.

Another aspect of the implementation modality is that day-to-day management is primarily driven by scientists with quite specific subject matter interests. This inevitably brings a bias to decision-making that runs counter to demand-driven research, and also does not easily lend itself to a farming systems perspective of the local situations in which the program operates.

C1b. Research outputs: quantity and quality

This sub-section addresses the first evaluation question in Annex A: To what extent has the research program developed scientifically valid and robust conclusions and professional-level outputs in the different sites? This query is composed of multiple layered dimensions. Responses in this sub-section focus on validated technologies, the main output of the research program. Several of the most interesting, relevant and important AR-related technologies are described below.

Genetic change and intensified planting densities

Participatory varietal selection played an important role in all program countries, especially in 2012 and 2013, in identifying well-adapted recently released varieties. Modern varieties were introduced in all cereal and grain legume crops in all Africa RISING countries, and have been highly significant in increasing yields at trial sites. These improved varieties and hybrids were mostly new to the beneficiaries who grew them. SeedCo SC-627, one of the maize hybrids recommended in Tanzania, was the exception, planted by farmers in three of the Babati research communities prior to program start-up.

Many of these improved cultivars combined early maturity with some disease resistance and good cooking and market characteristics. The CGIAR Centers figure prominently in the pedigrees of many of these varieties. In the focus group discussions with both men and women farmers, yield gains, attributed to varietal change, were estimated in the range of 30-60 percent.

For most farmers, sowing in rows with increased plant populations was synonymous with improved crop management that occurred simultaneously with varietal change. Sowing with narrower spacing between rows and higher plant densities in the furrow was identified with double rows of legumes in Malawi and planting with ropes in Tanzania. The most marked change in densities took place in Ethiopia, where row-planted wheat is replacing broadcast wheat in the four program sub-regions among beneficiaries in the research communities. In a few focus groups, farmers felt that the increasing planting densities was more valuable than switching varieties as a contributor to productivity change.

Across all the crops in the five countries visited, improved varieties of potato in Ethiopia appeared to generate the most interest, bordering on excitement. For example, focus group participants in Lemo Woreda in SNNP contended that potato could partially replace enset as a staple food, and that the research communities could specialize in potato cultivation. New potato varieties coupled with diffuse-light stores for seed was particularly successful. Market demand for potato as a low-cost vegetable is high throughout Africa. Potato seed requirements are 1.5 to 2.0 metric tons per hectare; most farmers had never seen the more recent releases in the 2000s and did not previously have access to seed.

Improved tuber seed of potato is one of the few introductions in Africa RISING where seed production—in farmer groups in this case—was explicitly factored into varietal change. For the other improved varieties, especially those that are self-pollinated, seed access and affordability is very much an outstanding issue that needs to be addressed in Phase 2.

Africa RISING has also generated information on the demand for characteristics in improved varieties that is being fed back into CGIAR crop improvement programs. This has resulted in the selection of faba bean varieties that can be utilized for forage as well as for grain in Ethiopia. Large-seeded cowpea varieties are highly preferred in Eastern and Southern Africa, as are bold-seeded early maturing groundnut varieties. In the future, earlier medium-duration pigeon pea varieties could make a significant difference in economically establishing the crop in Central Malawi.

Inorganic fertilizer and site-specific nutrient management

The judicious use of inorganic fertilizer has featured prominently among the technological options for maize in Ghana and Tanzania and for wheat in Ethiopia. Some of the most compelling research has been carried out in this area, and programmatic impact is likely to come as much from this area as any other, with the possible exception of genetic change and plant density management.

In Ethiopia, intensive trials over time in the benchmark communities show that response to fertilizer for wheat is conditioned by field position in the toposequence. This finding could change both fertilizer recommendations and blend composition in Ethiopia. The Mission is aware of its potential importance and has tried to foster its use in a recent project on the design of fertilizer recommendations.

The trials in Ethiopia not only focus on nitrogen, phosphorus and potassium but also on response to the micro-nutrients of boron, sulfur and zinc. They were patterned after earlier extensive research carried out in the semi-arid tropics of peninsular India in the early 2000s. That research changed the way that Indian soil scientists viewed fertilizer response in dryland agriculture on vertisols and alfisols quite similar to those in Ethiopia. The research in Ethiopia has the same potential to change the thinking about how soil scientists in the Ethiopian Institute of Agricultural Research analyze the results of comprehensive fertilizer trials in 64 *woredas*.

In Tanzania, farmers in the Africa RISING districts previously believed that application of inorganic fertilizer spoiled the soil. Moderate to high levels of yield response to mineral fertilizers in the on-farm trials have caused farmers to revise their beliefs. In Babati, a district with high production potential, focus group discussions revealed that village leaders and farmers thought the introduction of inorganic fertilizer was the most important contribution that Africa RISING made in the community.

Also in Tanzania, the program has supported the work of a fertilizer blending company that is using low-cost rock phosphate as a source of phosphorus. This is one of the first commercialized uses of rock phosphate, which is abundant in Sub-Saharan Africa. The recommended blend is called *Minjingu mazao* granular; this complex fertilizer is what farmers are adopting in the benchmark villages. Blends with boron, sulfur and zinc are also becoming available. However, NAFAKA recommends costlier but arguably more effective superphosphate.

Crop diversification

Crop diversification figures prominently as a desirable outcome in Africa RISING's R4D portfolio. Diversification away from wheat monoculture in Ethiopia and maize monoculture in Ghana, Mali, Malawi and Tanzania are operational targets that can be accomplished through either rotations or intercropping with grain legumes. Important interventions are strip cropping of maize/soybean and maize/cowpea in northern Ghana, the double-up legume systems as rotations with maize in Malawi, and maize/pigeon pea or maize/bush bean intercrops in Tanzania.

Gaps also exist in the current Africa RISING portfolio. Sunflower is ubiquitous in 11 of the 12 action research communities and in the FTF zone of influence in Tanzania. In some wards, the area of sunflower exceeds the area of maize. Sunflower contributes heavily to crop income of most farming households; several farmers in the focus groups suggested that sunflower warranted inclusion in Africa RISING and spoke to the need for earlier maturing, disease-resistant cultivars. An explanatory factor seems to be that no CGIAR Center has mandate for sunflower, pointing to a weakness within the current Africa RISING approach.

Given its very short duration and drought tolerance, more emphasis should also be placed on cowpea in the very dry semi-arid tropics of Kongwa and Kiteto. Africa RISING in Tanzania could also take a more aggressive approach in pushing pearl millet and sorghum in the same sub-region. The evaluation team viewed with alarm a high incidence of crop failure in maize in what was described as a reasonably good

rainfall year in 2015-16 in Kongwa. Similar situations were also observed in Ntcheu District, Malawi. Poor farmers with only a "plant-and-hope" mentality need to be weaned off maize.

Apple in Ethiopia is an emerging crop with prospects for domestic consumption and export. Progress made in Phase 1 should be reviewed to identify priorities for investment in Phase 2. Full exploitation of the bright market prospects for apple is too large a venture for Africa RISING to undertake alone. It requires collaboration from key partners in the value chain in the form of investment from other projects; however, African RISING can make important contributions to this effort building on progress in Phase 1. ICRAF should mobilize resources from other donors to support investment in apple R4D that complements program research in adapting the crop to the Ethiopian highlands.

In contrast, pigeon pea in central Malawi is a crop that seems to be more important to researchers than farmers. In the Extension Planning Areas visited, maize was planted on thousands of hectares; the area under pigeon pea barely exceeded 15-20 hectares. Focus group discussions with about 150 farmers turned up only one producer who ever sold the crop. Seed that is freely distributed to farmers may not be planted. Because of its importance in several of the doubled-up legume systems, a decision to divest of pigeon pea is not trivial, but its prospects for taking off in central Malawi, in contrast to southern Malawi, Tanzania and Mozambique, seem bleak unless accelerated varietal change occurs that will mitigate the problem of open grazing on the crop after maize is harvested.

Rice figured prominently as an important cereal in Africa RISING's design in 2012 and 2013 in West Africa and in Eastern and Southern Africa. However, collaboration with AfricaRice was not forthcoming; therefore, rice research was carried out only on an ad hoc basis in Ghana. Without rice, Africa RISING cannot contribute fully to Mission-funded programs that selected rice as one of their value chain commodities, such as ADVANCE in Ghana and NAFAKA in Tanzania. With the exception of one village in Babati District, rice is not a crop for farm households in the community research sites in Tanzania. In Malawi, it is cultivated in the *dambos* of several research communities in Malawi as a minor cereal.

One option moving forward would be for Africa RISING to reconnect with AfricaRice to determine their interest to participate in any new phase. However, this is not recommended because inclusion of rice in Phase 2 on a par with maize and wheat would require the selection of new sites in Mali, Tanzania and Malawi, which would mean a repeat of Phase 1 diagnostic and validation research. Africa RISING is too advanced to entertain that option, and it is too late to redress this programmatic gap in crop coverage.

C1c. Mechanisms for community-based research

While community-based research approaches are central to each of the participating countries within Africa RISING, there is significant variation among countries with regard to how community-based research actually occurs. Contextual differences in each country contribute to significantly different community-based approaches being pursued. Available resources, distance to site and the on-the-ground presence of CGIAR system partners are other factors. While respect for contextual difference is vital, room still exists for comparative analysis of different approaches to determine their efficacy and context where their performance is optimal.

Research approaches

In general, methods used to undertake on-farm research have been contextually appropriate and innovative. Researchers in the West Africa project have used community Technology Parks, baby trials and demonstration plots as their staple research/extension formats. In Ethiopia, Malawi and Tanzania, mother and baby trials were combined with selected researcher-managed experiments to validate technologies.

Such variations have helped tailor balanced approaches that embrace local and partner support context, and generally work well for crop research. In Ghana and Malawi, a critical mass of trials has been commenced where results will form an important contribution to understanding of maize legume inter-cropping. However, weaknesses were also observed, a main problem being trial intensity in Mali where political disturbances have been significant and disruptive.

In Ghana and Mali, Technology Parks have been established as a base for trials and demonstration. The parks provide an important meeting point for scientists and community members, and use regular "open days" to draw in the interest of the broader community. The acute difference is that Ghana has 25 community-based parks, whereas Mali has just two recently introduced parks operating at the district-level and servicing communities up to 50 kilometers away—and on bad roads. The strength of the Ghana model is that it is community-centered, allowing access and observation on a daily basis for many more than just those participating in trials. This allows a critical mass of trials to be overseen and is particularly appropriate to the context of Ghana, where few CGIAR system partners were based.

In Ethiopia, the concept of a community-based technology park overlaps with the local extension system in designated public land, some of which borders the benchmark research sites. Not all of these community extension small-plot demonstration areas are operational, and periodic budgetary scarcities compromise the extent of effort in these demonstrations on locally available government land; however, they serve largely the same purpose as AR's community Technology Parks in West Africa.

A significant weakness inherent to both community Technology Parks and mother-baby trials is that little consideration has been given to how livestock might be integrated within the cropping aspects of an area's overall sustainable intensification approach. While integrating livestock into community Technology Parks is technically feasible, it is regarded as not economically desirable or practical given the investment and management required. This position lacks imagination given Africa RISING's commitment to on-farm trial approaches.

More practical for on-farm livestock research centers around key themes using a lead farmer approach, complemented through extension and a structured approach to including a small group of interested farmers in the activity could work. To this end, organizational models such as Ethiopia's "one to five" model for knowledge dissemination could be effective. Community-based livestock approaches also need to be holistic in considering different dimensions of household livestock systems. Health, feed, management and breed selection are all researchable areas of acute relevance to sustainable intensification. Even where examples of good livestock practice were observed, it was rarely in a context of their potential interaction with cropping systems and soil fertility improvement.

While efforts are made within the research approach to develop community capacity to manage new technologies, they appear to be sporadic and overly reliant on observational learning. This is particularly relevant for women who have limited voice and capacity to assert themselves when training is occurring, have limited literacy, and are more time-constrained than men. Only very limited gender-disaggregated capacity building seems to exist. "Open Days" provide technical assistance and also draw interest of the broader community (i.e., those not participating in trials) in program activities. However, these occur only twice annually, suggesting they have limited capacity as a mechanism for knowledge transfer.

Intensity of on-farm cropping systems research

Improving cereal-based cropping systems is the operational research focus of Africa. In Ethiopia, cropping systems research is also important as it features identifying and validating solutions to the problems experienced by smallholder crop and livestock farmers in the highlands where wheat mono-cropping is a significant issue.

As such, the number and duration of on-farm cropping systems trials are important parameters for the program because more investigations in farmers' fields provide more options for potential adoption and greater opportunities for technology validation. Across the five Africa RISING countries, the amount of research per unit of budgetary expenditure varies substantially. The intensity of experimental research per unit of investment is highest in Ghana and Malawi. In northern Ghana, IITA and its partners have established Technology Parks, baby trials and demonstrations in 25 communities in three cropping seasons during Phase 1. In central Malawi, Michigan State University and the International Center for Tropical Agriculture have invested in more than 75 mother trials over 4 years (2012-13 and 2015-16) in eight communities. By 2015-16, this investment resulted in more than 1,400 baby plots in beneficiaries' fields.

The intensity of research also appears to be positively associated with the quality of research. Ghana is characterized by the timely reporting and rigorous statistical analysis of its trial outcomes in its technical reporting to USAID. Malawi enjoys bright prospects for high-quality publications because of its strong commitment to informative diagnostic research and longitudinal mother trials in the same farmers' fields over time.

At the other end of the spectrum, Mali and Tanzania have the lowest intensities of experimentation in the action research sites. With fewer budgetary resources, Malawi generates more than five times as much research output as Mali in terms of trial results. With roughly equal budgets, Ghana's annual research output is superior to Tanzania's by a factor of 5 to 6. On-farm research in Tanzania also tends to be more episodic and fragmented. Few mother trials are conducted in the same farmers' fields for more than two cropping seasons.

There are multiple reasons for the disparities in research output for Ghana and Malawi, and Mali and Tanzania. Malawi's work in Africa RISING on doubled-up legume cropping systems draws on more than a decade of cropping systems research under similar circumstances. Tanzania's action research sites are more distant and harder to get to than benchmark communities in the other four countries. However, too much delegation of research to partners is an important reason for the lower research output and perceived quality. In Tanzania, national program scientists and village-level extension agents figure prominently as the implementers of the research. In Mali, NGO staff are the main partners for carrying out some of the crop-related research, such as the evaluation of improved groundnut cultivars.

National partners in Tanzania have performed well in crop and land and water management research, but due to other responsibilities are limited in the time they can spend at the research action sites. Extension staff should be aware of all the research and development activities that are going on in their village, but they should not be responsible for carrying out mother trials that require specialized skills in implementation and analysis. This is the situation in Tanzania, where there is heavy reliance on national entities. Africa RISING's mandate is not to make its research sustainable in the benchmark sites; its emphasis in cropping systems research is to generate, adapt and validate technological options that lead to sustainable intensification.

The situation in Tanzania is further complicated by the fact that the thematic leader for crop management in Babati District resides in Kenya, and the thematic leader for genetic intensification in Kongwa and Kiteto Districts is posted in Malawi. Unlike Ghana, Malawi and Ethiopia, Tanzania and Mali have insufficient CGIAR employed staff available to support site coordination at country level. One coordinator per sub-region in Tanzania and one coordinator plus one assistant in Mali, where the sub-regions are not well-endowed with program office facilities, is simply not sufficient. Greater investment is needed to carry out the day-to-day research activities in the benchmark communities. Those staff need to be supported and should reside in the sub-region where the work is being carried out.

Currently, CG internationally recruited staff are spread too thin and are too geographically dispersed to sufficiently support quality research despite demonstrating a keen interest in and knowledge of the program. Of the five countries, Tanzania is the one where assistance in staffing is accorded the highest priority by the review team, given the lack of visibility and limited time spent by Africa RISING staff at the different program sites.

Monitoring of early adoption

Monitoring of early adoption is one of the thorniest issues confronting the scientists and management of Africa RISING. In principle, the FTF indicators should inform the extent of early adoption of specific technologies; in practice, these estimates are only indicative of what is transpiring because they are made largely from calculations that entail many assumptions.

Malawi, with MSU, is undertaking the most meticulous monitoring of early technology acceptance. The population of more than 400 baby plots in 2012-13 has been followed annually over the past 4 years. The program hopes that research results will be available soon, because it is likely to contain implications for methods for efficient measurement of early adoption for the other four countries.

More generally, efforts are not being taken within Africa RISING to quantify or estimate early adoption and technology spillover to other households in participating and neighboring communities, despite such data being critical to program scaling efforts. As a result, the program has no capacity to consider adoption thresholds as a tool for informing and guiding scale efforts. For example, adoption thresholds of a certain rate could be set as a mandatory requirement before technologies are advanced for scaling to the larger population in Development Objective 2. Such an approach would allow scaling efforts to be less ad hoc and more systematic. High levels of early adoption by beneficiaries in largely unsubsidized conditions with access to inputs should be the key criterion for advancement.

C1d. Research publications

Although peer-reviewed research publications were not a priority in Phase 1, there are several notable publications. For example, work by university-based scientists in Ghana on the individual variation in nutrition was highly informative on the determinants of malnutrition in the intervention communities. In Mali, baseline research by scientists at the University of Wageningen highlighted many important aspects of cereal-based cropping systems in Koutiala and Bougouni Districts in the Sikasso region. In Ethiopia, as mentioned, research into responses to varied fertilizer blends on yield and nutrient content of wheat has the potential to be of national significance.

However, while important and high-quality research is underway in all countries, much of it has yet to be finalized. Consequently, it is difficult to measure the degree to which advanced research and published information is having a tangible effect on decision-making and forward strategies related to sustainable intensification. Issues with scientists, including delays in hiring, have negatively affected research output. Additionally, IFPRI, whose advantage is policy research, has had an M&E mandate that has consumed almost all of its time and resources, denying it capacity to contribute its own research.

The exhaustive adoption research in Malawi that is due later this year will provide guideposts for early technology acceptance studies in the other four countries. Having a common framework of staying in the same villages in Phase 2 will give Africa RISING the opportunity to generate longitudinal panel data that establishes the basis for comparison across the three regional projects on understanding sustainable intensification. Such data are an important building block for high-quality publications that will be characterized by large impact factors.

C1e Effectiveness of research partnerships

The research partnerships that Africa RISING has forged in the five focus countries in Phase 1 are considerable. National agricultural research programs are engaged; notable contributions to research outcomes include L'Institut d'Economie Rurale (IER) in Mali in land and water management, SARI (G) in Ghana in vegetable research, the Selian Agricultural Research Institute (SARI T) in Tanzania in crop management and soil conservation, and the Sinana Agricultural Research Institute (SARI E) in Ethiopia. Lilongwe University of Agriculture and Natural Resources is the primary research partner in Malawi.

National and regional universities also participate intensively in Africa RISING in Ethiopia, Ghana, Malawi and Tanzania. Capacity building and graduate student theses are two important products of that collaboration. The commitment to the more recently established regional agricultural universities in Ethiopia is also laudatory. Scientists from these universities are actively involved in R4D Platforms in Ethiopia, an inclusion recommended for all country approaches to R4D Platforms. In Malawi, students are expected to present their findings to R4D Platforms.

It is also noted that some broader research being undertaken by CGIAR Centers of potential relevance to Africa RISING is not connecting with or being utilized by the program. These missing gaps largely pertain to IITA and CIMMYT and even ILRI in livestock research in the AR countries outside of Ethiopia. IITA's cropping systems research is absent in Mali on maize and in Ethiopia on enset; the International Wheat and Maize Improvement Center's cropping system research is lacking in Tanzania on maize and on wheat in Ethiopia. IITA, which is not present in Ethiopia and works on enset with a sizable grant from the Bill & Melinda Gates Foundation, are generating recommendations on varietal resistance that conflict with those of the regional university funded by Africa RISING.

Moreover, CGIAR Center expertise would be valuable to contribute to alleviating highly specific and important production constraints in the research action sites where knowledge is currently lacking. For example, the thorough diagnosis and the design of a program contributing to the eradication of bacterial wilt on potato in Long village in Babati District could be of mutual interest to CIP and to Africa RISING in Tanzania. Mobilizing informal visits by and eliciting selective inputs from diverse CGIAR system partners is not facile administratively, but being able to draw on the CG Centers' breadth of expertise in three to five highly focused areas of missing capacity could significantly enhance effectiveness.

Africa RISING also benefited from a productive partnership with Wageningen University, especially in the area of diagnostic research and situational analysis. That collaboration was most visible to the evaluation team in Mali. Going forward, well-defined opportunities for productive partnerships with advanced research organizations in developed countries should be further optimized.

Generally speaking, Africa RISING limits its vision of partnerships to those with which it has subcontracting arrangements. This denies the program the opportunity to identify, manage and strengthen key relationships with the many stakeholders that are not subcontractors but who share common interests and the potential to scale out program findings. Examples include:

- Lack of engagement with highly relevant and complementary USAID programs in Ghana
- Lack of engagement with important livestock research being undertaken by IER in Mali
- Lack of consideration of how Africa RISING might complement and collaborate with the upcoming USAID Agricultural Extension project in Malawi
- Limited or token participation of non-Africa RISING partners in R4D Platforms

However, positive outcomes result when Africa RISING plays to a partner's strengths and comparative advantage, as seen in the following ways:

- Integrated research between ICRAF and IER on innovative contour bunding practices in Mali
- The program leveraging MSU's longstanding research in double legumes in Malawi

- Mutually advantageous programming of Africa RISING and NAFAKA in Tanzania

In many other instances, partners are corralled into roles where they have no comparative advantage and/or to resolve resourcing management issues. For example, NGOs in Mali were tasked with monitoring agronomic research trials because the CGIAR system partner was not sufficiently present at the local level to fulfill the role itself.

High numbers of partners and CGIAR-affiliated scientists connected to Africa RISING lead to an impression of critical mass that may not actually be on the ground. Calculations by the evaluation team highlighted that the number of full-time equivalent scientists is generally less than one-third of the scientists listed as participating in the program. A number of the scientists listed do not allocate more than 10 percent of their time to the program, contributing to the need for "sub-sub-sub contracts" in which local institutions are contracted by externally based CGIAR system partners to undertake research at the local level. Large numbers of scientists that only allocate small amounts of their time to Africa RISING and sub-subcontracted partnerships are effective mostly in raising transactions costs and diluting programmatic resources.

Africa RISING's investment in R4D Platforms is largely an investment in mobilizing and strengthening partnerships, while helping ensure that future research will be demand-driven. Currently, stakeholders external to Africa RISING have only limited participation in the R4D Platforms, running the danger of the platforms being viewed as a project activity rather than an area-based development mechanism.

C1f. To what extent are capacity building elements promoted throughout the research program?

Africa RISING supports capacity building at multiple levels of implementation. R4D Platforms are designed to be a key point for identification and coordination of capacity building initiatives.

Community

Implicit in research protocols involving on-farm trials is the need to work with participating farmers to ensure sufficient capacity trials to be well-managed and produce meaningful data. Though many farmers demonstrated confidence and capacity in new technologies, capacity building efforts around new technologies generally lacked a deliberate strategy and were overly reliant on observational learning coming through the Technology Parks or the mother-baby trials.

Women generally were less capable of explaining the technical practice involved in their trials than men. In worst-case scenarios, women participants in groundnut trials in Mali knew nothing more of trials taking place on their land than that they were "better seeds," and they were not able to respond to questions related to varietal differences in crop management and varietal characteristics. No formal assessment of farmers' competency in new technologies currently takes place, even though this would shed important light on the current capacity building approach.

Academia

Local academic institutions are active in all five countries. Through these relationships, students have been supported in pursuit of M.Sc. and Ph.D. theses related to a broad range of issues of relevance to sustainable intensification.

As with the program in general, the weakness in Africa RISING's support to universities and students is a lack of emphasis on analysis of farming systems. However, some theses have been effective in helping assemble tangible, textured data that augment understanding of on-farm trials and, therefore, fleshes out Africa RISING's understanding of the metrics of sustainable intensification. For example, in Malawi, where doubled-up legumes is the key intervention, a nutrition-focused M.Sc. allowed analysis of how

households were utilizing increased legume yields. This research afforded Africa RISING insight in relation to consumption, the amount going to market, and gender roles and how they affect decision-making.

While women are active throughout Africa RISING, their knowledge of the "why and how" of different technologies is often significantly less than men's, suggesting a weakness in the capacity building approach. *Photo credit: Scott Rankin*

Government

Significantly, public-sector extension in four of the five countries is stronger than in many other countries in Sub-Saharan Africa—Mali being the exception. For instance, in Ghana, Africa RISING works closely with extension workers of the Ministry of Agriculture and (less commonly) with health workers of the Ministry of Health on nutrition issues. In the case of agricultural extension workers, considerable capacity has been developed and opportunities exist for these extension workers to promote and extend technologies being investigated by Africa RISING to sites external to the project.

While in-service training courses are one mechanism for training of government staff, extension worker skills are primarily developed in communities and on farms where trials are being rolled out. In interviews, extension workers spoke of training and exposure to new technologies being effective in

developing skills that they were able to apply both inside and outside Africa RISING project sites. However, in all countries visited, extension services were underfunded and working to manage persistent human and financial resource cuts. Extension workers also expressed concern about how they would be able to maintain their current levels of servicing to communities after Africa RISING closes, given the important support provided by the program to participating Extension departments.

As an R4D Program, Africa RISING was also engaged in the capacity development of scientists in collaborating national agricultural research programs. That engagement did not entail funding conventional graduate degree training for many NARS scientists. It was more opportunistic and responded to specific issues germane to the program. In Ghana, in-service training on data analysis was a priority capacity-building activity. In Tanzania, AR endowed the SARI research station with the means to carry out ELISA testing.

While women are active throughout Africa RISING, their knowledge of the "why and how" of different technologies is often significantly less than men's, suggesting a weakness in the capacity building approach.

C2. Research Objective 2

> *To evaluate, document, and share experiences with approaches for delivering and integrating innovation for sustainable intensification in a way that will promote their uptake beyond the Africa RISING action research sites*

The second research objective encompasses dissemination of results and technology transfer among local stakeholders, with a focus on uptake beyond intervention communities. Africa RISING decision-making in relation to the most suitable approaches for transferring technology is, to a large extent, determined by the characteristics of each validated technology. Because of the delays in effectively implementing Phase I, extension research envisaged in Objective 2 has been negligible. Research Objective 2 would loom larger in a second phase as Objective 1 recedes in importance to it and to the twin Development Objectives discussed in the next sub-section.

C2a. How effectively are research designs harmonized among partners across sites?

Given Africa RISING's core focus of farming systems analysis, harmonization of research activities is imperative, both among partners in local sites and across sites, along with the need to preserve sufficient flexibility to adapt to local context. In some cases, strong complementarities exist between individual activities. For example, consideration of women's workload issues, nutrition, income generation and soil fertility were in some isolated locations being actioned through a holistic approach to soybean cultivation in northern Ghana. Also in Ghana, some technologies were being universally trialed and compared across each of the 25 Technology Parks, allowing for comparative analysis. In Malawi, an intensive and harmonized focus on double legume approaches across all sites brings rigor and critical mass to this specific effort.

However, the evaluation team found missed opportunities for greater levels of harmonization and integration between activities in an integrated area response. Although it is common to see a diversity of activities within a community, the potential synergies between these activities is lost, and their interaction with each other does not always focus on the research approach. This relates in part to the program being insufficiently resourced and present at the local level. Different staffing compositions are in play across different sites, but local staff in almost all sites are seriously stretched and, therefore, poorly placed and insufficiently empowered to advocate for the possible synergies and integration. Gaps in research also interact with weaknesses in capacity development. For example, support to poultry expansion is a sensible and welcome investment generally focused around a grant of birds and support for improved housing. While both initiatives have significant potential, they are undermined by an insufficient focus on bird health, as evidenced by many bird beneficiaries who have only limited

awareness of vaccination regimes and disease transmission routes, and a lack of engagement of beneficiaries' neighbors who pose a serious threat to flock health and trials being undertaken. Furthermore, the potential nutritional impact of bird meat and eggs was paid little attention and poorly understood by bird beneficiaries. Management and use of chicken manures was also not broached.

Poultry is a sound example for other reasons. It is generally a small-scale activity with only a handful of beneficiaries per community, which means it is usually a low priority for local managers. Despite this, it is an activity common across the program, with a diverse range of implementation approaches being undertaken. However, there are currently no mechanisms for consideration of lessons learned across this cluster of issues. A similar story could be told around tree legumes being developed for the dual purpose of nitrogen fixing and as a nutritious fodder.

The upside of the current approach is that it brings clear and specific focus to component options, allowing for each component to be clearly understood in its own right. This allows partners to work in a coordinated fashion, from which diagnostic research can be integrated. However, at this point there is little evidence of Africa RISING moving toward more integrated solutions.

C2b. Have sites resolved the tension between standardization and contextual differences?

It is vital for Africa RISING to adapt to and respect contextual differences, and recognize the degree to which effective on-the-ground implementation needs to reflect sophisticated understanding of local social, economic and governance dynamics. Still, there is significant common ground across the different project and country work plans and research agendas. However, it seems common that similarly focused research agendas are sufficiently different that they are poorly positioned for comparative analysis. For example, building off the example above, poultry housing intersected with poultry disease management are researchable topics of relevance in all locations. However, the degree to which trials vary in approach, the data gathered, and the manner in which knowledge is shared fail to leverage Africa RISING's potential to reach important conclusions on this sustainable intensification option.

Contextual differences are also cited to justify the different implementation modalities seen across the program. Even within the West Africa project, considerably different mechanisms are in place in Mali and Ghana, especially concerning political and governance issues. In Mali, local NGOs perform a central role in day-to-day management of activities and are in many respects the "face" of Africa RISING at the community level. This relates in part to Mali's political crisis, which coincided with program commencement, and also to the lack of capacity found in the Malian extension system. In Ghana, where there is both strong local civil society capacity and a heavy presence of leading international NGOs, there is effectively no engagement or incorporation of NGOs in implementation with the local extension system central to the implementation approach.

CGIAR Centers' on-the-ground capacity also contributes to varied implementation approaches. Africa RISING's Kongwa and Kiteto region in central Tanzania is an arduous, all-day drive from the Eastern and Southern Africa project base in Arusha, contributing to Africa RISING's very "light touch" approach in that region, which is heavily reliant on local actors.

Monitoring and reporting of field activities varies considerably across Mali and Ghana, making it difficult for standardized M&E approaches capable of facilitating reliable and meaningful comparative analysis between similar trials in different sites.

Understanding and addressing contextual nuance is vital. And while standardization of trials between sites is not possible or desirable, it is felt that greater rigor could be applied in helping ensure that the knowledge being generated through similarly focused trials is more easily aligned and comparable.

C2c. What opportunities are there to encourage the application of research outcomes to appropriate, comparable sites?

In three important senses, Africa RISING is well-placed to encourage the application of research outcomes to appropriate, comparable sites. Firstly, and most importantly, USAID has invested in FTF development programs that the technological output of AR can feed into.
Secondly, progress in GIS approaches facilitates and increases the reliability of recommendation domains. Africa RISING in Tanzania is already investing in GIS to assess the spatial extent for scaling up AR-related technologies within the country in general and USAID's ZOI in particular.

Thirdly, improved varieties figure prominently in AR-related technologies. CGIAR Centers have more experience in multiplying and distributing seed of improved varieties with partners than they have in any other area of development. In each of the five countries visited, the centers and their partners are responsible for distributing hundreds of tons of self-pollinated grain legume seed in the Tropical Legumes Program, financed by the Bill & Melinda Gates Foundation. These are often the same crops that Africa RISING is focusing on to complement cereals.

On the other hand, Africa RISING is not ideally placed for research on technology transfer. CGIAR Centers, including IFPRI, do not have a comparative advantage in research on extension, so Africa RISING should explore collaboration with specialized partners and programs, such as the USAID-funded Modernizing Extension and Advisory Services program, which partners with the University of Illinois. Advanced research institutes in U.S., European and Australian universities are other prospective partners. In principle, the randomized control trial format for M&E should be conducive for research on technology transfer in a second phase.

Research on technology transfer also requires investments in technology transfer. Africa RISING's need to be better positioned for technology transfer was clearly highlighted in Tamale in Ghana, where three FTF-funded programs coexist: Africa RISING, ATT and ADVANCE. Essentially, no line of communication exists among the programs, despite considerable complementarity and potential for the whole to exceed the sum of the parts; ATT's focus on appropriate technology dissemination and ADVANCE's interest in strengthening local value chains are areas where Africa RISING clearly needs support. Conversely, staff interviewed at ADVANCE expressed concern at the quality of the research being undertaken by their partners, opening a door for Africa RISING to support them.

R4D Platforms present another important opportunity for extension of learning to other sites. In several locations, multiple platforms exist in the agriculture and value chain space; in others, critically important actors are unaware or not engaged in the platform. R4D Platforms are in essence a network. Achieving strong, broad-based, self-sustaining networks has proven challenging across the world. To that end, the evaluation team is concerned that there is insufficient awareness among Africa RISING staff of the workload needed to achieve functional and sustainable networks.

Technologies ready for scale out and transfer

Cereal/legume strip cropping, featuring intercrops of maize and soybean or maize and cowpea, have proven popular and are an area of considerable interest to farmers across the program. However, they are also complicated technologies to validate and demonstrate because their effective demonstration seemingly requires multi-year cultivation and treatments of both species sole-cropped with the cereal/legume intercrop and the farmer's control.

D. Interim Findings Related to Development Objectives

Africa RISING's two development objectives aim to ensure a pathway that facilitates the carriage of research findings to outcomes that support smallholder farming households out of poverty, both within

and beyond the action research sites. Implicit in the objectives is recognition that agricultural research and innovation alone will not be sufficient to lift families out of poverty. Innovations need to be complemented with actions that facilitate dissemination and adoption; foster the active participation of disadvantaged cohorts, especially women and children; and ensure that efforts are in place to maintain and enhance ecosystem stability.

D1. Development Objective 1

To create opportunities for smallholder farm households, within Africa RISING action research sites, to move out of poverty and improve their nutritional status—especially of young children and mothers—while maintaining or improving ecosystem stability

D1a. What are some of the more promising technology or innovation packages developed for adoption by smallholder farmers?

While Africa RISING has introduced many individual innovations, few examples were observed of truly complementary packages of initiatives or systems-based interventions.

Support to the introduction of new, early maturing crop (particularly maize) varieties has been a standout activity of Africa RISING. These are greatly appreciated on multiple levels, including their capacity to adapt to the effects of climate change. Benefits enjoyed from early maturing varieties are significantly enhanced by complementary work undertaken in relation to rotations, row planting, intercropping, relay planting and strip cropping. As already stated, reliable and affordable access to these new varieties remains an area of weakness and concern.

Among the early maturing cowpea varieties are several that farmers preferred for not just food but also fodder due to their vigorous growth habit. However, as mentioned, little deliberate attention has been placed on the role of vegetative plant matter as fodder or post-harvest handling of the fodder.

Opportunities exist for extension of soil erosion programming. Contour bunding technology was popular in Koutialia, Mali, where land characteristics and terrain are appropriate, because it is seen as an appropriate method for maintaining moisture to address and improve soil productivity. Erosion control work undertaken in Kongwa in Tanzania , while seemingly having significant room for further improvement, had been effective in mitigating much of the impact of massive floods that had recently gone through the area.

In Mali, the ICRAF is promoting food gardens, whereby field plots are lined with baobob treelings, roselle (hibiscus) and/or amaranth, from which women can harvest fresh greens for daily consumption. While this form of support is restricted to relatively few households, it is seen as having potential in better promoting the efficacy of homestead systems.

More generally, isolated examples of work in nutrition are scattered across the program. In Ghana, awareness-raising in relation to the nutritional value of soya has occurred based on the willingness or availability of women in agriculture extension workers to undertake activities. Where it has occurred, women cite significantly changed behavior around feeding and planting of soy beans.

While many promising livestock technologies exist across the program area, Africa RISING has only limited investment in many of them. Technologies demonstrated as "promising" by other actors revolve around affordable feed, animal health, housing and targeted vaccination programs. Poultry is one facet that the program is invested in across most sites. However, the quality of this programming is varied and information sharing or comparative analysis absent. At their best, poultry initiatives have proven highly effective in augmenting women's incomes through assistance in improved, affordable housing, disease management, effective vaccination regimes and broader community awareness.

D1b. What are the criteria used to define promising technology or innovation packages?

No specific criteria exist for defining promising technologies or innovation packages. Trial results and farmer satisfaction with different technologies appear to guide forward planning. R4D Platforms should play a role in endorsing promising technologies in a given area. However, systems are not yet in place, nor do they have sufficient capacity to adequately fulfill that role. However, Africa RISING partners, alongside other donors and USAID agricultural experts, are concluding a process to define workable sustainable intensification indicators.

The direction taken for this sustainable intensification framework consists of five domains: productivity, economic, environment, social (including gender) and human (including nutrition, food security and education). These domains exist across four scales (i.e., levels): field/plot, farm, household and a macro-level zone of influence.

D2. Development Objective 2

To facilitate partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites

Development Objective 2 is designed to expand uptake of technologies beyond communities (or cohorts within communities) participating in the program. For this to be addressed, the program is expected to have delineated impact pathways that detail the steps necessary to carry field research through to scaling. Locally, this can occur through community-based mechanisms, local extension services, regional departments of agriculture and development actors active in the locality. Broader progression will occur through strategic engagement of development partners and policymakers.

Across the program, little attention has been paid to monitoring adoption within participating or neighboring communities. Given that almost all program participants receive research inputs of one form or another free of charge, monitoring of independent adoption is seen as critical in informing planning moving forward. Access to inputs within local market places is another area where insufficient attention has been paid.

This taxonomy of potential outcomes underscores the importance of documenting acceptance in early adoption studies for the most promising, well-specified technologies. On average, only 3-5 percent of farmers directly participate in Africa RISING activities in intervention communities as workers in community Technology Parks or as owners of fields where baby trials and demonstrations are conducted. Technology adoption by these project beneficiaries is not as informative as spillover and diffusion to other farmers in the village as a whole. However it is only within Technology Parks and farm-based trials that results are being gathered. Understanding of adoption outside Africa RISING is based primarily on anecdotal and observational analysis. Measurement of diffusion in a more rigorous and quantifiable manner is needed.

Adoption by non-project participants is more likely to reflect the experience of non-beneficiaries outside the community who will have to rely on farmer-to-farmer communication to make the initial decision to invest in the technology in unsubsidized conditions with incomplete information on performance. Finding early acceptance by a threshold number of non-beneficiary farmers in the intervention community in an unsubsidized market environment provides the best confirmation on wider dissemination of the validated technology. To the evaluation team's knowledge, an external acceptance threshold has not yet been documented for specific technologies. Documentation is required to demonstrate that demand for different technologies is strong.

At a more elemental level, Africa RISING lacks strategy in its engagement of those partners capable of facilitating widespread dissemination. While improved engagement of FTF-funded activities inside the

program's ZOI's is an obvious step needing to be taken, a swathe of other, potentially significant actors also need to be engaged in both the government and non-government sectors.

D2a. To what extent has the impact pathway delineating the steps from field research through to scaling (dissemination and adoption) been mapped out and used by the different elements within Africa RISING?

There is only a limited strategy in place to clearly articulate, action and monitor the steps from field research through to scaling. As described above, the program relationship with the broader stakeholder environment is weak and largely contained to those with whom it has a subcontracting relationship—and, to a limited degree, other USAID-funded programs. This ignores the fact that in each Africa RISING location, a diverse range of development actors is undertaking agriculture-related work through programs that address livelihoods, gender, the private sector, natural resource management and the environment, coming through multilateral, bilateral or international NGO mechanisms.[6]

Thus far, there is only limited engagement by Africa RISING of the private sector. This is a significant gap on the impact pathway given the importance of targeted communities being able to access the inputs needed for technology adoption in the marketplace. This can be explained by the program still being focused on its research objectives, but also by limited attention and resources devoted to local-level communications and stakeholder liaison.

This overall context is explained by two factors. First, the program is not as far along as anticipated, so it has fewer results to disseminate than expected. Second, effective engagement of external partners is a complex process requiring strategy and an appreciation of their needs. Africa RISING is not set up in a manner that ensures such skills are available at the local level. These are the same skills needed to mobilize and motivate greater levels of inclusion, participation and local ownership of R4D Platforms.

With strategic and constructive engagement, these stakeholders could be engaged as partners or collaborators in a "win-win" situation, given many of them do not have capacity to undertake the quality of research that Africa RISING can, just as CGIAR system partners do not have the skills necessary for high-level community engagement, mobilization and development.
As mentioned, R4D Platforms have the potential to address at least some of these shortcomings, but currently do not have the structure or capacity to proactively court participation of the broader agriculture and livelihoods sector.

D2b. In what ways have relevant partners (especially Missions and the private sector) been engaged in the different stages along the impact pathway?

While all five U.S. Missions interviewed expressed interest in Africa RISING and recognized its potential contribution to their broader FTF effort, it was evident in most instances that only limited and irregular lines of communication exist between the program and the Missions.

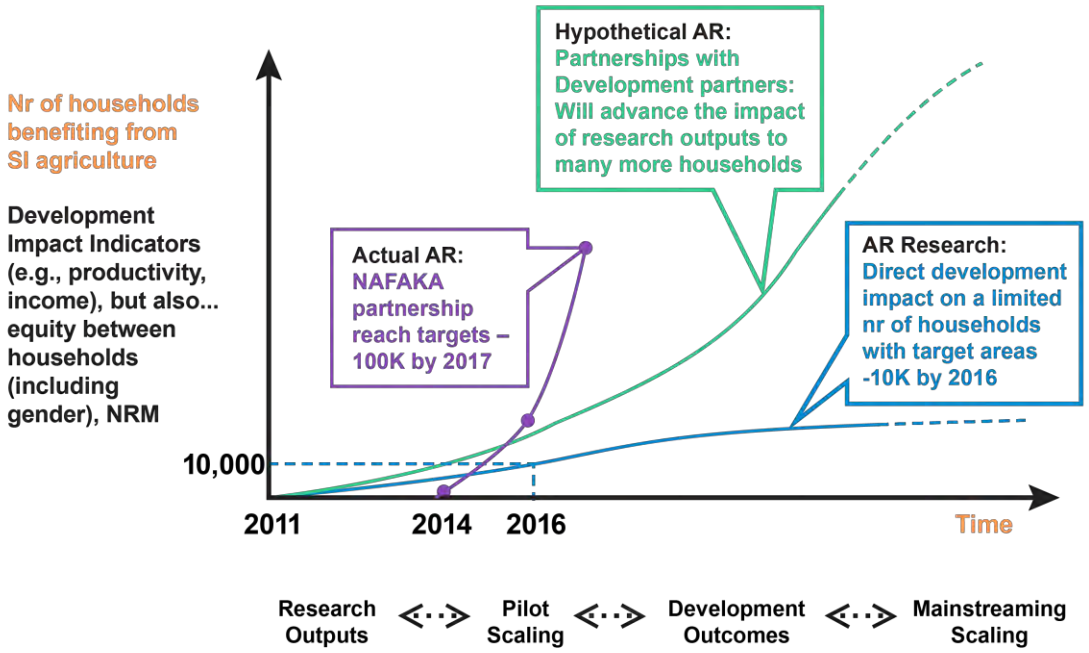
Although there is an appreciation of the role the private sector needs to play to address input, marketing and other value chain elements, there is only limited evidence of actual engagement. Private sector representatives barely participate in R4D Platforms in Ghana, leaving a gap in the program's logic with respect to input supply and market access. For the most part, these representatives are small, local traders hoping to benefit from the relationship, but who also require some support if they are to fill supply and/or marketing gaps within a locality. For example, a local trader in the Kongwa-Kiteto R4D Platform is interested to support local provision of early maturing seed varieties, but is currently unable

[6] For example, the International Fund for Agricultural Development, the Food and Agriculture Organization of the United Nations, IrishAID, the UK Department for International Development and World Vision.

to access these varieties. Africa RISING seems inadequately resourced or interested to assist on this front.

Opportunities also exist in terms of engagement of private veterinary services to ensure better -quality animal health care is available, including robust vaccination programs and reliable vaccine access.

Exhibit 6. The Africa RISING-NAFAKA Relationship



D2c. What opportunities are there for current and potential partners to further contribute to Africa RISING?

Africa RISING's relevance as a program is inextricably linked to the identification of viable pathways to promote adoption of validated technologies. Though these are lacking and there is a need for more sophisticated analysis of the stakeholder landscape, potential synergies and complementarities exist—and will continue to exist—between Africa RISING and the many other FTF-funded projects.

The consistent opportunity across most FTF projects is to assist in ground-truthing of research findings and the capacity to very quickly scale up to beneficiary numbers that Africa RISING is simply unable to achieve. Exhibit 6 (previous page), provided to the evaluation team by Africa RISING, illustrates such opportunities by showing the potential of the program's relationship with NAFAKA in Tanzania.

Exhibit 7 (illustrating the Africa RISING-NAFAKA relationship) is relevant to all research-for-development partnerships. It demonstrates the strengths of different FTF partners, and highlights the balance of academic rigor required by the "inventor" (researcher) alongside the more entrepreneurial approach of development partners who are aware of the need to maximize benefit from a donor's investment and address sustainability.

NGOs are also active in the agriculture space and stand to benefit significantly from access to reliable, evidence-based advice from Africa RISING.

More generally speaking, the program's efforts to promote the concept of sustainable intensification will likely be more successful if Africa RISING programming actually reflects different aspects and intersections of sustainable intensification's different elements—crops, soils and livestock. Commonly, the technologies/innovations that lead to sustainable intensification are known. It is the socio-cultural and economic drivers of smallholder homestead management of household assets, notably time and labor, that need to be understood.

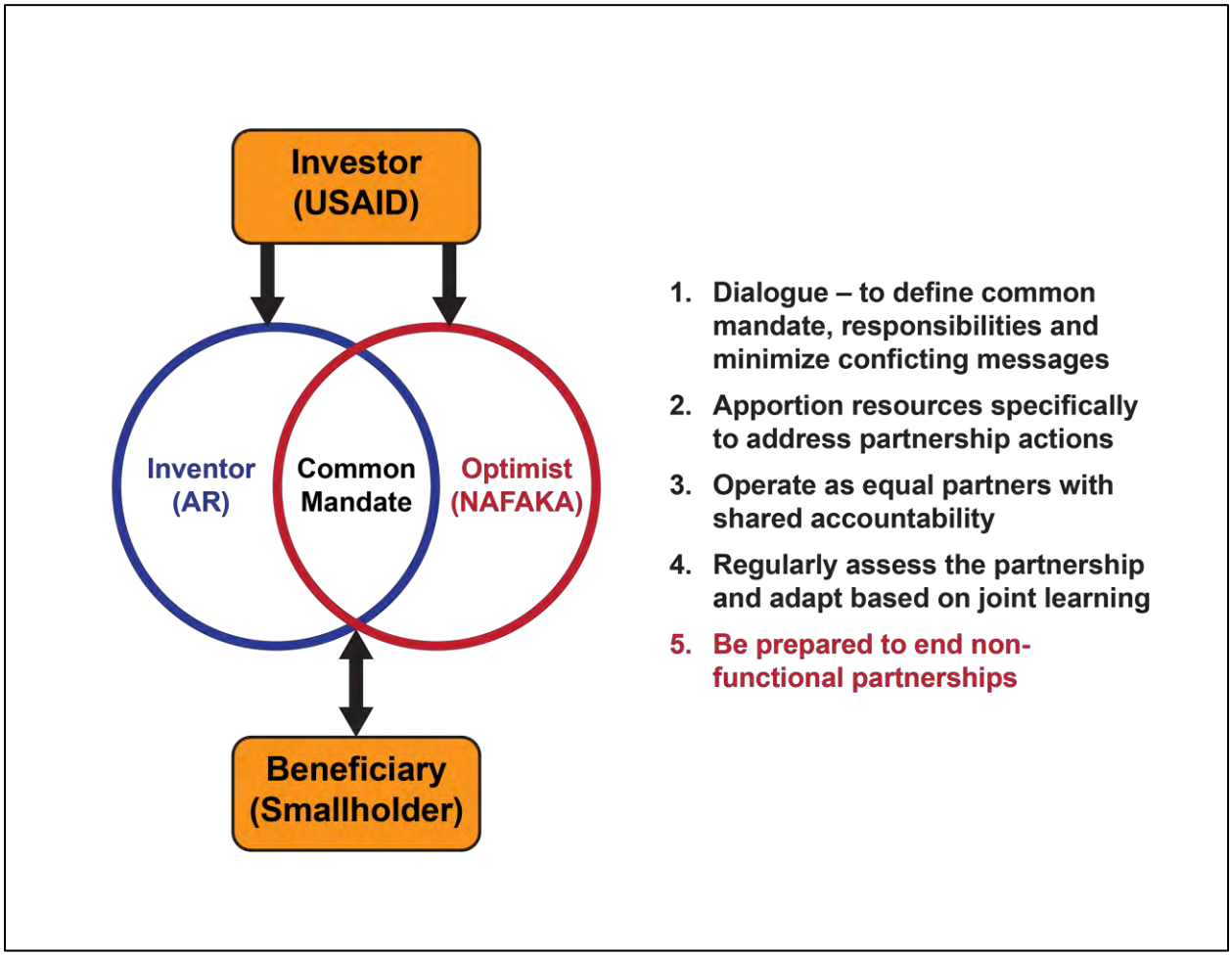
Enhanced activity around livestock is one obvious entry point, with NGOs such as Heifer International ready to participate as a development partner that can provide some of the costly inputs. Enhanced activity around improving soil health is also important because declining soil fertility is a significant concern of smallholder farmers and of acute interest to many organizations for which "sustainability" is a key driver.

Building membership, momentum and ownership for R4D Platforms

Having persistently observed World Vision signage during the trip from Arusha to Babati in Tanzania, the evaluation team sought an impromptu interview with a World Vision agriculture specialist in their Babati Cluster office. Received cordially, the agriculture specialist explained that World Vision had multiple Area Development Programs in the area, each with an annual budget in the hundreds of thousands of dollars, and most of them occurring over an average implementation period of 10 years. In Hallu village, Babati, where both World Vision and Africa RISING are operational, World Vision is considering options for a major water infrastructure investment. Although the agriculture specialist was very excited at the potential contribution and benefit from access to Africa RISING data and expertise, he was not aware of the program nor the R4D Platform, and had no knowledge of World Vision having been invited to participate in it—though did acknowledge that "maybe my boss knows about it." Irrespective of who knew what, this represents a missed opportunity. It also demonstrates the need for persistence and a more deliberate campaign to motivate well-resourced, influential, long-term NGOs such as World Vision to participate and feel ownership within the R4D Platform.

The CGIAR system's capacity for high-quality research is a major strength of Africa RISING; it could easily open doors and leverage important partnerships. However, the program has not prioritized development of partnerships. Effective stakeholder engagement will require expertise and resources in terms of staffing and documentation of results.

Exhibit 7. The Research-for-Development Partnership Relationship



D2d. What opportunities are there to maximize dissemination of technology or innovation packages to smallholder farmers?

The best opportunities for maximizing dissemination come through achieving critical mass whereby enough producers are using validated new technologies, whether related to crops, livestock or land and water management—or a combination of these. Such a scenario cannot be achieved by Africa RISING alone. Critical mass will only ever be achieved by more active engagement of development partners external to Africa RISING, who have the commitment and resources necessary to support dissemination and promote adoption. This is in large part a program management issue, requiring more strategic engagement of key partners to promote the "win-win" potential of Africa RISING's research focus complementing their development programming. This is generally poorly articulated and actioned.

Within this is the urgent need to address crucial constraints. Communities must have confidence that the inputs necessary for adoption are affordable and available, and consideration must be given to maximizing the nutritional and/or economic impact of different technologies.
Dissemination will also be aided by lead farmers demonstrating to peers their confidence in the relevance of different technologies and their capacity to apply the technologies identified through Africa RISING. This traces back to capacity building and ensuring participating farmers are not only active and hands on in trials, but confident and articulate in explaining the process, purpose and benefits of those

trials. Here again, development actors have a key role to play given they are traditionally more proficient in areas such as communications and community mobilization.

And as already mentioned, Africa RISING would benefit from better monitoring the adoption dynamics of different technologies in order to have "evidence at hand" to leverage potential scaling partners to buy in and run with these technologies.

This same compelling evidence is critical in terms of engaging and lobbying ministries and other key national bodies capable of consolidating lessons being learned through Africa RISING research. This exact process in Malawi has allowed Africa RISING to play an instrumental role in the government's official endorsement of doubled-up legume cultivation.

More generally, across the FTF ZOI, Africa RISING is in the unique and enviable position of having highly complementary FTF programs to which it can contribute validated technologies with high adoption potential. Investing in a liaison position for active, consistent and strategic engagement of obvious partners (e.g., the ATT and ADVANCE in Ghana, the Agriculture Extension support program in Malawi and World Vision in Tanzania, etc.) could yield dividends in consolidating linkages, eventually leading to enhanced technology dissemination. Africa RISING is also positioned to add further value to the FTF program by backstopping any of the adaptive research that is undertaken by these programs. Within this overall FTF program dynamic are important learning opportunities for Africa RISING in terms of better understanding what types of technologies are being accepted where and why.

The program would also benefit from greater emphasis and capacity being applied to its community engagement approach, possibly through strategic alliances with local development partners that have in-depth knowledge of the social dynamics and social capital available in an area. Africa RISING is a research-for-development program; within that continuum is the need to draw in at the earliest possible point high-quality community engagement and community development skills to ensure the program clearly understands community needs, priorities and development dynamics. This does not seem to be the case now given the program's heavy reliance on local governance mechanisms and community leaders to guide its strategy at the community level. Although this can be effective, additional approaches are needed to ensure whole-of-community understanding and avoid elite capture of resources.

E. Findings Related to Program Management and Organization

Africa RISING presents a sizeable management challenge given a vast array of actors, ranging from CGIAR system partners to local civil society, participating in implementation. This challenge is exacerbated by the program being composed of three different regional, ecosystem-focused projects spread across six countries. Furthermore, different organizations perform the role of lead agency in different projects, different countries and even different regions, according to project composition. This complexity was strategically addressed through the evaluation to ensure that the voices of the many different layers of stakeholders were heard and differences in approaches fully understood.

Another significant management challenge is facilitation of a pathway from research findings to development outcomes. Such an ambition requires strong and mutually respectful partnerships among research bodies, development organizations and donor agencies. Currently, alliances across the program are heavily dominated by CGIAR system partners, with agriculture departments and local development organizations being cast in the role of subcontractors, often asked to perform roles that do not play to their strengths.

A related management weakness has been inadequate engagement of complementary development partners. As has been noted repeatedly, there is only limited engagement evident of other USAID-

funded activities, let alone relationships with the agriculture/livelihoods programming of non-U.S. donors. Such initiatives have the potential to carry Africa RISING's research findings from the confines of the intervention communities into the development mainstream.

Central to the Africa RISING logic and management model are the R4D Platforms, the aim of which is to bring research and development actors together to identify challenges, solutions and opportunities for cooperation. These require sensitive and professional management to ensure the broader research and development community in the platform area feels both benefit and a true sense of ownership of the mechanism. This is not currently the case in any of the R4D Platforms.

As discussed above, R4D Platforms were slow to be initiated and are still developing and consolidating. This is significant in a management sense, because the platforms were envisaged as an important mechanism for identification and endorsement of local research agendas, as well as an independent point for validation of technologies. These networks currently rely on Africa RISING resources, but have no sustainability planning, raising questions about the degree to which they can be truly independent.

These are all important steps in delineation of a viable impact pathway. Without high-quality, strategic and persistent engagement of these different actors, it will be difficult for Africa RISING to realize its important research findings being scaled up and out to the world beyond its own research sites.

CGIAR systems partners are currently de facto representatives of Africa RISING at the country level. However, it is unclear whether these representatives have the right skill set to manage, maintain and maximize the relationships needed to carry program research findings forward. Encouragingly, the program has begun to invest in social sciences, recently recruiting a gender advisor and economist. This should allow the program greater scope to engage potential partners on their priority topics.

E1. Communication of Africa RISING's Strategic Vision

Those inside Africa RISING appear to have a relatively clear sense of its purpose and clarity about the role they play. What is less clear is the degree to which these subcontracted partners have a genuine voice in strategic planning and decision-making, and what ability they have to challenge decisions being taken at the center.

Over the course of the evaluation, the review team spent significant time with many of the local actors sub-contracted to support Africa RISING implementation. While they universally understood and were capable in their specific role, few were able to explain Africa RISING's overall purpose and approach with any sophistication. This is significant in terms of building a constituency of support for the program, and in ensuring an aligned strategy across different sites. It also means that Africa RISING is often not well promoted at local levels when opportunities arise to engage with potential collaborators.

This was most evident within the various R4D Platforms which seem primarily geared at local levels to specifically support *implementation* of Africa RISING activities rather than *dissemination.*

Given their potentially pivotal role in promoting change at the local level, it is vital that the program maintain strong lines of communication with all relevant development actors, including those with no direct stake or role in Africa RISING. Currently, the majority of key government and non-government stakeholders have very limited understanding of the logic underpinning the program, which contributes to a lack of appreciation of its research focus, and perceptions that it essentially has the same goals and capabilities as the other development programs in the area.

This context is also impacted by the sparse range of program documentation developed. While the program churns out a wide range of documentation, a gap seems to exist in terms of higher-level,

purposeful documentation and resources that detail the program's purpose, approach and achievements at local level. The program website is reflective of this. While it carries a mountain of information, it is presented in a poorly coordinated form that defies easy navigation and fails to reflect the texture and nuance of the program's on-the-ground presence.

Both the program website and Wiki page contain a vast catalogue of data. They would benefit from a more coordinated and standardized approach in the way that information is presented across the different projects, which would make it more user friendly for those going to it for a first visit.

E2. Harmonization of Administrative Components

A significant challenge relates to Africa RISING's geographic spread and the fact that many of its lead scientists oversee research that is occurring in another country. This leads to situations of "sub-sub-subcontracting" whereby the CGIAR system partner contracts a local agricultural research institute that then subcontracts a local university, which then passes the task to a graduate student. While this presents a great opportunity for local capacity development, concerns exist that the value of the remote-based CGIAR system partner gets lost in the mix.

More generally, high numbers of partners and International Agriculture Research Center-affiliated scientists leads to an impression of critical mass that doesn't actually exist. Based on observations of the West Africa Regional Project, the number of full-time equivalent scientists is only about one-third of the scientists listed as participating in the program. A number of the scientists listed do not allocate more than 10 percent of their time to the program.

Other mechanisms exist for knowledge transfer, including regular meetings and workshops, internal mechanisms of different CGIAR system partners, and personal relationships developed over the course of the program to date.

E3. Program Monitoring and Evaluation

The M&E goal of Africa RISING is to support effective project management, provide data for timely reporting to project funders and assist stakeholders in clearly understanding reasons underpinning program successes and failures. By providing learning opportunities on what has worked and what has not, the M&E system should help shape and inform the design and implementation of new interventions, as well as catalyze adjustments to ongoing activities that might enhance efficiency and effectiveness.

While this goal is laudable, it presents a significant challenge given the breadth of activities occurring across six countries, under the management of different CGIAR system partners. This context, in part, explains the lack of clarity around roles observed by the evaluation team in relation to M&E. While IFPRI is tasked with leading M&E, it has been insufficiently staffed to do the work properly and therefore must rely on local monitoring capacity. For their part, local partners have regarded M&E as IFPRI's task. This has resulted in gaps in monitoring and information sharing.

Furthermore, a significant proportion of the M&E financial and human resources available to IFPRI were devoted to the Africa RISING Baseline Evaluation Surveys (ARBES), restricting the role they were able to play in guiding day-to-day M&E. While the ARBES was the source of some short-term pain due to its delayed implementation and availability, it is a thorough and detailed snapshot of target communities across six countries from which important longitudinal performance measurement can occur.

An important contribution of IFPRI has been development of a Project Mapping and Monitoring Tool, developed to aid project monitoring within and outside Africa RISING and help users (i.e., project managers, donors, researchers, data analysts and stakeholders) understand where and how activities are taking place. It was also designed to improve project strategic planning and partnerships so their work

had greater impact. Although it took time for the tool to settle into the system, there are signs of greater user confidence and improved compliance with program data protocols.

Two important challenges have been identified during implementation. Firstly, isolating and measuring the performance of an individual technology on one farm when multiple farming systems interventions are at play is proving to be a considerable challenge—significant in a farming systems-focused program. Also, the program has little capacity to measure adoption.

The evaluation team regards IFPRI's comparative advantage to be policy research, built upon high quality evaluative work. IFPRI appears poorly positioned to undertake program monitoring work, as implied by their "M&E role." To date, IFPRI has contributed almost no supportive output to strengthen Africa RISING's efforts with technology validation, which relates back to inadequate program monitoring providing insufficient beneficiary data of specific technologies…. a vicious circle that needs to be addressed in any subsequent phase.

Overall, Africa RISING faces a challenge in more profoundly understanding how it identifies and works with farming systems, and then works to quantify the impact of systems-based innovations, given such approaches sit at the core of its philosophy. This situation has further contributed to challenges in reporting on FTF indicators, given a lack of clarity around the sustainable intensification innovations being implemented through the program.

F. Overview of Key Findings

The following section aims to overview in summary form the findings described above in terms of:

- Agricultural activities and approaches that were viewed as extremely promising and should be considered for expansion and uptake across the whole program
- Areas where good progress is being made but where the evaluation team believes opportunities exist for further strengthening

F1. Agricultural activities regarded as extremely promising with potential for expansion and scaling

Research related to field crops has produced very important, contextually specific findings that are ready for both expansion and promotion for scaling.

- Africa RISING's core focus on improvement of staple cropping systems is its most valued contribution. Technologies related to row spacing, planting density, intercropping of legumes, "double-double" legumes improved seed varieties, and fertilizer applications form a sound platform going forward, with significant opportunity for a more robust approach to technology transfer across sites.
- Examples of location-specific approaches that have been successful include strip cropping of maize/soybean and maize/cowpea in northern Ghana, the double-up legume systems as rotations with maize in Malawi, and maize/pigeon pea or maize/bush bean intercrops in Tanzania.
- Testing of blended fertilizers and organic resources in Ethiopia have been high quality, influential and are contributing to the fine tuning of national recommendations.
- While only suited to certain locations, Africa RISING activities related to potato production have been well thought through and holistic in approach, effectively energizing local communities.

Many of the approaches detailed above are "climate smart" in a context where threats posed by climate change are significant. Despite this, the approaches are rarely presented through the lens of being climate smart, even though this could potentially help garner interest from potential collaborators.

In circumstances where women have been engaged through Africa RISING in a structured and empowering manner, they have tended to succeed, and present themselves as role models to younger women and girls in their communities. While the program's gender performance overall has been weak, there is enough success across a range of different technologies to suggest that targeting of women is an area of great potential—especially given Africa RISING's claim to be focused on outcomes that benefit women and children.

When initiated thoroughly, poultry have proven to be highly successful. Characteristics of better performance include sophisticated approaches to disease management (including work with the broader community to ensure understanding of disease transmission); lower cost, accessible housing, feed and management approaches; and consideration of marketing options.

Efforts in Ethiopia suggest that integrated approaches to homestead agriculture have the potential to immediately impact households, particularly the lives of women and children. Diversification coming from such approaches is climate smart, spreading risk, while also diversifying nutritional opportunity. While homestead strategies by definition need to be contextually appropriate and relevant, opportunities exist for AR to establish homestead models in every country that work with respected, community-minded lead farmers, as has been successful in Ethiopia. Models should be heavily supported and investments made to ensure that all potential components are realized within the homestead system. Based on learning emerging from these model sites, Africa RISING should provide communities the pathway to apply for AR grants to establish the models.

Strategic staffing at local levels as seen in both Ghana and Ethiopia appears to be a critical component of program success. While this inevitably comes at some cost, it is an important leading investment if the program logic is to be actively actioned.

F2. Areas where good progress is being made but opportunities exist for further strengthening

One uniform performance indicator applied to smallholder farmers for all Africa RISING initiatives is their end capacity to ease financial hardship and help chart households toward a more prosperous future. While this is stating the obvious, more detailed economic analysis is an element of Africa RISING that needs more deliberate focus and attention given the complex association between markets and small landholders. Households need to be supported with necessary (and accessible) financial modeling that shows the incremental benefits to households engaged in sustainable intensification efforts. Issues related to accessing key inputs need to be more actively addressed. Such studies should ensure that monetary, nutritional and other benefits are measured.

Without exception, communities consulted during the evaluation spoke of their desire for support to address livestock management and productivity. Furthermore, the issues and needs expressed were relatively uniform: disease management, the need for improved bloodlines and feed options, a realistic focus on small ruminants and poultry, and an interest and willingness to establish community groups for livestock management and a system for gifting of progeny to others in the group.

This uniformity presents a framework for research and action on livestock across the program. Despite this, there is only limited livestock programming and seemingly very little effort to connect lessons learned from livestock programming across countries.

Trials related to livestock feed exist across the program, as do opportunities for better use of crop by-product as a feed option. Consideration of options for dry season feed need to be pursued and rolled out into a business development approach. In particular, Africa RISING has initiated a lot of activities

related to nitrogen fixing fodder trees, with ILRI testing for nutritive values. While these activities are ubiquitous, research coming from the trials is lagging. Once complete, these research findings should be rolled out into a coherent business program as part of the recommended livestock package to be developed for program-wide distribution. Furthermore, varietal work with groundnuts, soybeans and legumes can be interfaced with animal feed opportunities considering multi-uses of these crop varieties.

In a similar vein, farm (or community)-based mechanization has been trialed through initiatives involving the introduction of chopper and grinders for improved feed management and production. However, research flowing from these initiatives is not yet available, though the findings might well form an important part of a stronger business enterprise development approach.

R4D Platforms are an appropriate initiative to support Africa RISING's program logic but require more astute support and management. It is vital that they work in harmony with existing extension and coordination mechanisms, and are heavily focused on achieving broad-based support from local research and development actors. In Ethiopia, the presence at ZOI level of sufficiently resourced and skilled staff seems to have facilitated greater traction for R4D Platforms that position Africa RISING well moving forward.

In addition to facilitation of R4D Platforms, an appropriate staffing composition at the local level is important across various dimensions of Africa RISING, with potential to address monitoring weaknesses and enhance understanding of adoption trends.

5. LESSONS LEARNED

This section highlights key lessons learned during Phase 1 of Africa RISING. As such, the section will focus primarily on potential areas for improvement rather than the many areas described above where Africa RISING has made solid progress.

Sustainably intensified farming systems

Africa RISING was conceived to initiate action research and development partnerships that "create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition and income security, particularly for women and children, and conserve or enhance the natural resource base." Such an approach encompasses multiple and complex development concepts and challenges. It therefore runs the risk of being interpreted differently by different actors, especially in the context of insufficient program documentation and a multitude of stakeholders, each with their own priorities and mandates.

An observation of the evaluation team is that the program lacks the laser focus on farming systems analysis that it was conceived to have and that will set it apart from the many other activities in food security, incomes, nutrition, gender and natural resource management being undertaken by other researchers and development practitioners. Too often, activities have been commenced and allowed to proceed in relative isolation, with insufficient consideration or operationalizing of their potential contribution to broader farming systems analysis, as implied in the program concept and strategy.

In its first phase, Africa RISING over-reached trying to achieve more than was manageable in the timeframe with the financial and human resources at its disposal. It also had limited on-the-ground management capacity and an inadequate system for program monitoring, despite the imperative for a program of Africa RISING's nature to address the challenges inherent to systems analysis and its requirement for extensive vertical and horizontal collaboration and problem solving.

The program is also underinvested in various aspects of sustainable intensification. Livestock, homestead farming systems and efforts related to nutrition and marketing are limited, undermining the program's ambition to break new ground in relation to understanding farming systems.

Within this critique, the evaluation team recognizes the significant challenge and steep learning curve involved in such a complex program. The team also observes considerable momentum across most sites in terms of increasing clarity of how the program can contribute to a truer farming systems approach in the future.

Laying strong foundations

For many different (and some unavoidable) reasons, Africa RISING's inception period was confused and unhelpful in laying sufficiently firm foundations and structures from which a fully coherent program could be built. The "quick wins" period of the first year was rushed and therefore counterintuitive to development of a program needing to be strategic, innovative and considered in bringing clarity to the complex challenge of sustainable intensification of smallholder farming systems. In many respects, the first year was more a conceptualization and design period than it was the inception period from which a program would be launched.

This unorthodox start-up contributed to relatively "light touch" program documentation, which denied the program sufficiently clear guidance in terms of approaches, targets and indicators appropriate to farming systems. This in turn has denied program actors, especially those from outside the CGIAR system, a clear and authoritative voice regarding the purpose and process of Africa RISING.

This should not be an issue in a subsequent phase, given current momentum and the vast amount of information gathered over the past 5 years. However, it will still be as important that any new program be set up with a clearly articulated approach, targets and indicators.

Fully understand and engage stakeholders in target locations

Implied in Africa RISING's research-for-development logic is the need for strategic identification and engagement of stakeholders at multiple levels who are capable of collectively and collaboratively contributing to the program's goal. This includes the complex challenge of facilitating a sense of complementarity and shared purpose between the program and its stakeholders.

Unfortunately, across all sites visited there was only limited understanding of who was doing what in the program's target area, let alone strategic engagement of these different stakeholders. This absence of stakeholder mapping denies Africa RISING the raw materials necessary to articulate impact pathways for its technologies. It also prevents potential synergies, resource-sharing and the development of trust with entities that are the frontline candidates for their capacity to facilitate scaling.

In particular, Africa RISING enjoys a common donor and considerable complementarity with other FTF-funded endeavors. This lack of sustained strategic engagement of these projects is a lost opportunity, given their high capacity in areas that are not the comparative advantage of the CGIAR system.

Effectively engage and include communities

Cultural differences, community cohesion and social capital are some of the factors affecting the degree to which Africa RISING's work is able to penetrate a community beyond the 3-5 percent of households participating in trials. It was observed across the different communities that, although some were committed to knowledge sharing and ensuring benefit for all, other program participants closely guarded knowledge in an attempt to protect their privileged access to free inputs supplied by the program.

It was also observed that it was commonly empowered community elites participating in trials. This can be explained in part by the program aiming to work with self-selecting, lead farmers. However, it was also evident in some communities that the broader community resented the best-resourced people being the ones who benefited. Such attitudes have the potential to affect adoption rates and reduce social capital.

Community engagement and development are not areas of comparative advantage for the CGIAR system. They are also skill sets increasingly recognized for their specialization and complexity. In many locations, improved stakeholder mapping and engagement would allow Africa RISING partnership with and access to local civil society organizations' capacity for high-quality community engagement, as well as their deep understanding and knowledge of social relations and community dynamics.

It is also common for civil society organizations to have established community-based organizations or cooperative mechanisms within communities (e.g., savings groups, women's groups and Farmers Associations). These mechanisms are community assets that could be better engaged and utilized by Africa RISING.

Crops and participatory varietal selection

Participatory varietal selection played an important role in selecting well-adapted, recently released varieties in all Africa RISING countries, and resulted in modern varieties being introduced in all cereal and grain legume crops in all countries. This access and the results that followed are greatly valued by participants and are of great interest to non-participants.

In many communities, however, accessing seed of the varieties under trial is difficult or impossible. This is slowing the adoption potential of many varieties at a critical point in time. Generally speaking, the program has not paid enough attention to seed access and options for community-based multiplication.

Address marketing and input access issues

Common to most program sites are poorly developed agricultural markets that affect input access, technical assistance and selling opportunities. Africa RISING's research and technology validation focus seems to have prevented active consideration of strategies that address marketing issues. Because Africa RISING is providing key inputs to most trials, issues related to input access have not compromised the trials being undertaken. However, it does seem to have prevented expansion of technologies on participant fields, and adoption among neighbors and neighboring communities.

In relation to livestock, the use of commercial feed as an input by scientists deters producers from considering options for using local feed sources, and also stifles development of linkages with private sector providers.

Resolving complex marketing issues is challenging, but other FTF projects focused on value chain and technology are operating in the program's same or neighboring target areas. Better leveraging the comparative advantage of these programs could go a long way to resolving local marketing issues, and also be insightful for better understanding how the local market landscape affects different commodities. Such relationships could also bolster longer-term sustainability of program interventions by helping consolidate and strengthen local markets.

Better incorporate livestock

Without exception, communities consulted during the evaluation spoke of their desire for support to address livestock management and productivity. Furthermore, the issues and needs expressed were relatively uniform: disease management, the need for improved bloodlines and feed options, a realistic

focus on small ruminants and poultry, and an interest and willingness to establish community groups for livestock management and a system for gifting of progeny to others in the group.

This uniformity presents a framework for research and action on livestock across the program. Despite this, there is only limited livestock programming and seemingly very little effort to connect lessons learned from livestock programming across countries.

Livestock presents considerable potential for supporting nutritional outcomes. In particular, poultry are kept by most households, though commonly suffer an annual die-off (usually Newcastle's Disease). Support to address bird disease would be welcome and an important contribution for poor households. Success of poultry interventions appears to correlate with the robustness of the approach, and its ability to address known issues such as disease in more than a token manner. For example, it is close to pointless to vaccinate poultry only within individual households, yet this is Africa RISING practice in many communities.

Working more holistically to develop livestock value chains is also a need, whereby feed, housing, healthcare, reproduction and market engagement are factored into a more complete response. In most locations, development partners are already undertaking livestock work, and could logically be partnered with in a "win-win" situation that allows them access to high-quality research and technical assistance.

Homestead farming systems

The overwhelming majority of Africa RISING trials are on-farm and off-homestead. Although it is acknowledged that crops are the livelihoods mainstay of most smallholders, homestead farming systems still present significant, mostly under-developed sustainable intensification opportunities. These systems are inadequately engaged by the program currently, despite having significant potential in terms of home gardens, fodder/fuel wood, fruit production, composting, livestock management and other aspects important to livelihoods and nutrition security. A "diversified and intensively managed" homestead farming system has the potential to produce a variety of nutritious food crops—home gardens, spice/medicinal gardens, fruit and fertilizer fodder trees, intercropped legumes, etc., representing improved integration of agricultural practices with nutritional benefits.

Nutrition

Opportunities exist in relation to a more deliberate program strategy for understanding nutritional issues and opportunities within the program cohort. While nutrition outcomes are explicitly stated in the program purpose and Africa RISING's research and development objectives, specifically nutrition focused activities are rare and poorly integrated within the overall program approach. Also, local-level program monitoring fails to capture data relevant to nutritional impact. This is a missed opportunity, since it is very likely that the program is having a positive nutritional impact by virtue of increased and diversified agricultural production being achieved through cropping trials. However, without a deliberate effort to dissect and quantify that impact, the program misses an opportunity to gain traction among the many specifically nutrition focused programs that exist in the target area.

Greater gender capacity and inclusion

Explicit within Africa RISING's overall objective is an ambition to address well-being issues among women and children in smallholder farming families. However, the evaluation team observes an implementation bias toward activities, technologies and systems dominated by men.

This is not to suggest that women are not active in the program. They are, making up approximately one-third of participants. However, because there is little nuance in the way Africa RISING works with women and men, women must often adjust to a capacity building or technology transfer approach that

was designed with men in mind. As a result, women often lack the same levels of awareness of the "why and how" of their trial.

A recent gender assessment prepared by IITA is frank in its assessment of Africa RISING's gender capacity. It highlights that both a lack of capacity and confidence is apparent within the implementation team, resulting in a program that is disproportionately geared toward the interests of men.

Improved gender capacity, greater disaggregation of planning and training in relation to trials, and efforts to empower women as equal and legitimate actors in the promotion of sustainable intensification are needed. Greater recognition and prioritization of the role of homestead farming systems would be one important entry point for greater inclusion and responsiveness of women, though this will need to be handled with sensitivity and dynamism since it runs the risk of consolidating gendered work roles that often confine women to the homestead.

Inclusive R4D Platforms
The R4D Platform concept is relevant, important and appropriate to Africa RISING's R4D objectives. The platforms' proposed strategy of drawing together key stakeholders active in an area to collaborate, identify common issues of importance, share information and identify opportunities for collective action is sound. Implicit within the R4D logic is broad-based and equitable participation.

Unfortunately, R4D Platforms have failed to achieve traction in most sites, at both the community and area levels. Commonly, development actors long active in an area are unaware of the platforms; when they are, they perceive them as an Africa RISING activity, designed to further Africa RISING objectives. Although this is true, the success of the R4D concept requires facilitation of a genuine sense of ownership and benefit among all participants—researchers, development practitioners, government, private sector actors or community members.

Network initiation and facilitation is a complex challenge, with global research highlighting that most networks fail and are unsustainable. If initiation and facilitation are to succeed, they will require deft management and highly strategic identification and engagement of key stakeholders, stemming from high quality and thorough stakeholder mapping exercises. Potential partners need to be courted and supported into Africa RISING in a way that assures them that they will have a voice and stand to benefit from their participation.

Measure adoption
Central to Africa RISING's ambitions is the ability to clearly communicate its results to the development audience outside of the CGIAR system. Voluntary, unsupported adoption of a technology is, in the eyes of those development organizations most likely to support scaling efforts, a key indicator.

Africa RISING is not currently recording adoption data, nor is it capable of measuring adoption rates. This denies the program a key component of the evidence base needed to encourage investment in the technologies being researched and identified.

6. RECOMMENDATIONS

This section presents recommendations in relation to a possible Phase 2 of Africa RISING. The program purpose to *create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems* through a research-for-development modality remains relevant and conceptually sound.

The lead recommendation of the evaluation team is that Africa RISING be continued into a second phase, based on the momentum and greater clarity of purpose now achieved, following a slow and complicated start.

A. Phase 2 Program Structure and Focus

Africa RISING is first and foremost a vehicle for research into sustainable intensification of smallholder farming systems. Through the relationships and understanding it has developed across a highly relevant sample of communities, and because of the high quality baseline survey undertaken, the program is well placed to build on the momentum achieved toward the end of Phase 1.

> **Recommendation:** Africa RISING should continue in the same sites in Phase 2, but its current cohort of direct beneficiaries (i.e., those that receive direct input subsidies) should be graduated out of the program and replaced by new beneficiary households to maximize technological exposure within the community. Such an approach would also provide an important window on the desirability of technologies, given beneficiaries from Phase 1 would need to decide whether or not to procure what had previously been provided as a free input.

Results from early acceptance studies in populations of beneficiaries and households in the community as a whole should play a key role in decision-making on specific technological options to be advanced to the wider scaling that is envisaged in Development Objective 2. This should help ensure Africa RISING pursues technologies that have the best prospects for diffusion in a well-defined recommendation domain. On passing a well-defined acceptance threshold, a prospective technology should be deemed as validated and promoted for technology transfer. AR needs to address the question: What is the level of acceptance that indicates sufficiently good prospects for technology diffusion to warrant an investment in subsequent scaling?

> **Recommendation:** Africa RISING should decide on the level of early acceptance that is synonymous with validation in relative or absolute terms in percent of farmers or number of farmers exposed to the technology of interest for which early adoption has occurred. Acceptance research acts as an operational bridge between research and development, and should focus first on the owners of baby plots as the beneficiary population. Acceptance research should be conducted systematically across the five target countries and Zambia and not carried out in an ad hoc manner.

Validation of technologies is also complicated by the constraint that many farmers face in accessing the inputs relevant to a given technology. Seeds of specific improved varieties fall into this category.

> **Recommendation:** In order to be able to more effectively measure demand, Africa RISING must work to ensure that farmers have access to validated technologies at market cost, including more active collaboration with relevant value chain-focused FTF activities.

The program is currently heavily invested in landscape aspects of sustainable intensification, through its heavy focus on cropping systems. Even though women are active and work hard in this landscape, men are responsible for the majority of the decision-making. Conversely, homestead farming systems in which women have far greater control and decision-making authority are under-represented in the Africa RISING portfolio of activities.

> **Recommendation:** Develop twin drivers toward the program's sustainable intensification goal around both landscape farming systems and homestead farming systems. This can occur through continued support to field crop trials, erosion management and irrigation improvements that have demonstrated potential in Phase 1, augmented by a specific, integrated homestead farming system focus that ensures women are more profoundly involved in Phase 2.

While women form a large minority of program participants, their involvement is often token and based on adapting to priorities determined by men.

- **Recommendation:** Africa RISING should place more deliberate emphasis on gender-disaggregated planning and supporting women's specific areas of interest (e.g., small ruminants, poultry and dry season vegetable production) and in other areas that compensate for women's lack of access to land
- **Recommendation:** Enhance the program's gender capacity through appointment of gender advisors in each regional project, overseen by a program-level gender performance coordinator

Reflective of women's limited voice in the program, nutrition programming and research is sporadic and poorly integrated with other programming efforts. Nutrition requires a more deliberate strategy and greater resources. The absence of systems to measure nutrition performance is a lost opportunity because it is likely that Africa RISING has a good nutrition story to tell.

- **Recommendation:** Consider opportunities for more widespread integrated nutrition programming that complements programming in relation to agronomy and livestock.
- **Recommendation:** Ensure nutrition efforts harmonize with national nutrition approaches (against which FTF nutrition approaches should already be aligned), and provide opportunities for capacity building and active participation of government nutrition workers.
- **Recommendation:** Use nutrition-focused activities as an entry point for greater levels of involvement of younger women, because the program's current work with women mostly involves older women.
- **Recommendation:** Establish systems or enter into partnerships that allow for measurement of the program's nutrition performance.

Livestock programming is currently inadequate given its centrality to the concept of sustainable intensification and importance to the livelihoods and well-being of smallholder farmers, especially women. Fortunately, the issues raised across the five countries visited in relation to livestock are relatively uniform, allowing research to be relevant across countries.

- **Recommendation:** Africa RISING should prepare a program-level "guide for effective on-farm livestock research" to be a key resource to guide the establishment of a realistic and feasible research agenda that examines issues related to animal health, genetics and feed. This would also help align efforts and comparability of results across countries.
- **Recommendation:** Cooperation with livestock-focused programs of FTF and NGOs such as Heifer International should be pursued. Such partnerships potentially offer an important complementarity and a "win-win" for Africa RISING and its partners, given the latter's capacity to invest in animals.

Generally, resource allocations need to better reflect the different dimensions implicit in sustainable intensification, as well a more deeply invest in systems analysis.

Recommendation: In terms of research resource allocation, livestock, homestead systems, and farming-systems interactions should receive greater emphasis in Phase 2 compared to Phase 1. Crop research should be assigned somewhat less attention in the future than in the past. Early in Phase 2, AR should conduct a priority-setting exercise across the regional projects to establish reasonable targets for research resource allocation in Phase 2 in line with budgetary expectations.

Africa RISING works primarily with an older demographic, with limited visibility of younger women or men in trials. This seems to contradict its ambition of affecting the next generation.

Recommendation: Any future phase should ensure opportunities and strategy that more proactively targets the participation of younger women and youth (i.e., the next generation).

B. Partnering and Institutional Participation

In order to achieve its scaling ambitions and be better positioned ahead of Phase 2, Africa RISING needs to be aware of and connected to the various development communities in its areas of operation. Although these communities will vary considerably according to a range of factors, each will contain critically important relationships with which Africa RISING must maintain functional relationships.

Recommendation: Each country should be supported to prepare an "End 2016 Stakeholder Map" that identifies and describes the areas of focus of all research and development actors of relevance at the national and local levels. Such an exercise would be instrumental in identifying potential partners for the short and long terms.

In Phase 2, Africa RISING management should try to consolidate and develop targets for the various research partnerships negotiated in Phase 1.

Recommendation: Demand for institutional gap filling includes partnering with a creditable national university program in Mali, linking up with the private sector on well-defined opportunities such as maize hybrids and treated seed products, and widening CG participation in Ghana in general and in maize research in Tanzania and Mali, in potato in Tanzania, and in enset research in Ethiopia in particular.

R4D Platforms should form an important gathering point for agriculture actors in localized areas, as well as be an important mechanism for dissemination and scaling of Africa RISING learning. Though establishment of networks is relatively easy, sustaining them is complex and requires unique skills.

Recommendation: Using the results of the stakeholder mapping exercise, the program should work to ensure platforms are sufficiently inclusive and not competing. Where other similarly focused platforms or networks exist, the program should work with those parties to rationalize into one mechanism driven by key local actors.

Currently, across the program, there is insufficient engagement of the private sector, denying the program on multiple fronts related to input access, marketing, new technologies and technical support.

Recommendation: Explicit strategies should be developed in each program location that map private sector actors alongside community needs. This could occur as part of a broader stakeholder mapping exercise proposed below.

Lack of coherency in program M&E was a significant weakness of Phase 1, related primarily to a lack of clarity around roles and responsibilities that were not resolved until late in the program. IFPRI's role in establishment of the program M&E structure is now more or less complete, allowing them to focus in the future on higher level program level evaluation and research support, where they enjoy strong comparative advantage.

- **Recommendation:** In Phase 2, IFPRI's contribution needs to be more clearly focused on investigations that ensure high quality analysis of the research and development contribution of AR.
- **Recommendation:** Any second phase requires a far more robust and connected program M&E framework that plays to the strengths of all participants, including greater clarity around monitoring needs and roles.

C. Staffing

Currently, Africa RISING's staffing profile contributes to an impression of critical mass that may not actually be on the ground, with many scientists having only a 10 percent full-time equivalent allocation to Africa RISING. In some cases, these scientists are not based on site, meaning their contributions on the ground are limited.

Recommendation: Consider the pros and cons of demanding a minimum 20 percent full-time equivalent commitment from scientists participating in any new phase of Africa RISING. This will

ensure sufficient time is available for these scientists to actually contribute to the program.

Staffing of project sites is handled differently by different centers and projects. A correlation exists between a relevantly structured local staffing complement and results achieved. Capacity to build local relationships, foster R4D Platform development, troubleshoot, monitor and act upon potential synergies, and generally ensure a cohesive implementation require capable people—not just one person—on the ground. Ethiopia has one of the heavier local footprints, and it was able to achieve more diversified and coherent programming with greater levels of local ownership than other countries.

Recommendation: Establish small, efficient program implementation units at the local level in all program regions (based on the model seen in Ethiopia) that are tasked with partner engagement, monitoring and troubleshooting.

In Phase 2, management should augment program staffing in key areas that would service and supervise work in Research Objective 2 and Development Objectives 1 and 2 at the program level across the three regional projects.

Recommendation: Candidates for staffing at the program level include a seed production specialist, a GIS presence, and a social scientist focused on early adoption research. Such positions would assume AR-wide responsibility across the five countries of interest.

Low research output in Phase 1 in Mali and Tanzania is a cause for concern moving into a potential Phase 2. More field research staff should be employed directly by the CGIAR Centers responsible for a specific country or sub-regional project. In addition, it is felt that without placing at least one internationally recruited staff in the two sub-regions where the action research sites are located, it is unlikely that low research output can be reversed and lead to highly positive development outcomes in a Phase 2 in Tanzania.

Recommendation: At least one internationally recruited scientist from IITA and ICRISAT should reside in the two sub-regions where the research is conducted in Tanzania.

D. Research

As described, the program has now reached a point where a firm foundation has been established through Research Objective 1. It is important now that the program continue along its R4D continuum, while also managing unresolved issues from the first phase.

- **Recommendation:** Largely because the profile has been filled, PVS and plant population management is an area that should receive declining research attention in Phase 2. However, there are still some loose ends to wrap up. PVS could be more informative if farmers could choose from elite lines and were not restricted to released materials. Only in Tanzania can farmers select elite lines. In Malawi, farmers' demand for PVS after 2014 has not been met.
- **Recommendation:** One or more of the success stories in Phase 1 will require some maintenance research in Phase 2. The prime example is to ensure that bacterial wilt does not threaten the progress made on potatoes in Ethiopia.
- **Recommendation:** Sunflower in Tanzania warrants inclusion in the research portfolio in Tanzania.
- **Recommendation:** More focused research on postharvest issues and losses is warranted

In some specific areas, Africa RISING research has significant potential for policy impact.

- **Recommendation:** Research in Ethiopia on site-specific nutrient management has a large potential for policy impact. The program needs to continue to invest in events and opportunities that enhance the potential that the research findings will influence decisions on fertilizer recommendations and blends.
- **Recommendation:** Engagement of Malawi's Ministry of Agriculture around double up legume

technologies should continue to be further progressed.

Similarly, Africa RISING needs to be more deliberate in disseminating and promoting its findings among FTF actors.

Recommendation: In Tanzania, support for the use of rock phosphate is a valuable contribution to soil health. The discrepancy in recommendations between AR and NAFAKA needs to be reconciled, most likely in terms of recommendation domains for *Minjingu mazao* or NAFAKA plus in the FTF Zone of Influence.

An inevitable challenge needing to be considered in subsequent Africa RISING phases will be whether or not to divest of crops in its current portfolio due to changing government priorities.

Recommendation: AR should not divest of crops in its R4D portfolio simply because government priorities change. This recommendation applies especially to Ethiopia where barley, faba bean and potato are unlikely to appear as priorities in the most recent agricultural development plan. Responding to shifting government priorities would erase or substantially erode most of the gains that were made in Phase 1.

Single component research is best tackled in a crop improvement program and not in an integrated farming systems-oriented program such as Africa RISING.

Recommendation: Research in to Maize Lethal Necrosis and *aflatoxin* should be considered for divestment in Phase 2.

In Phase 2, operationalizing the concept of sustainable intensification and quantifying the consequences of validated technologies on the natural resource base warrants more emphasis.

Recommendation: The effects of technological options on nutrient depletion are prime candidates for assessment. In dry and highly variable sub-regions of the semi-arid tropics, such as Kongwa and Kiteto, validation is incomplete without accounting for the influence of production variability. Sophisticated modeling is not a prerequisite for validation. Simple water balance models and sensitivity analyses are often sufficient for this purpose. The consequences of inter-year variability in rainfall need to be addressed.

Despite drought being the main source of ecosystem instability in the target area, research on the incidence and consequences of production variability in general and drought in particular is largely absent in Africa RISING.

Recommendation: The program should analyze and initiate research on the incidence and consequences of production variability, particularly that thought to be due to drought.

The program places significant reliance on a functioning extension system, despite knowing that extension systems in each country face multiple constraints. CGIAR Centers, including IFPRI, do not have a comparative advantage in research on extension and have conducted few, if any, persuasive studies in this area.

Recommendation: Africa RISING should explore the potential for collaboration with specialized partners and programs, such USAID's Modernizing Extension and Advisory Services project, which partners with the University of Illinois, and other areas of expertise.

Annex A. Evaluation Questions

Exhibit A-1. Outcome Measures—Research Objective 1

Research Objective 1: *Identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
To what extent has the research program developed scientifically valid and robust conclusions and professional-level outputs in the different sites?	• Africa RISING research reflects and responds to challenges articulated by farmers • An inventory exists of on-station and on-farm research disaggregated by country, subregion and cereal-based cropping system • Trials are well described in the inventory and/or publication and adhere to best research practices • High-quality research is prepared and published	• Research results are well documented, with an inventory of on-station and on-farm results maintained • On-farm experiments are evaluated statistically and economically when costs differ markedly among treatments • Technologies and/or combinations of technologies were found to have scientifically robust conclusions • Researchers express satisfaction at being able to utilize program-wide data, as relevant, within their own research • Research results are adopted and replicated—locally and regionally	• Compilation of data from reporting • KIIs • Program and project reporting • CGIAR staff • Development partners

Research Objective 1: *Identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
What opportunities are there to increase the number and/or quality of research outputs and outcomes?	• Improved cost efficiency of research trials • Research exchanges between the different sites carried out • Process developed and implemented for new research trials, including criteria such as farmer need, climate consideration, relevant value chain, etc. • Compelling impact pathway articulated from research to development	• Statistical shift from research-station/researcher-managed trials toward farmer-managed trials • Multisite research results have uptake in multiple locations	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers
How effectively do the different research partnerships contribute toward a rigorous process and quality research outcomes?	• CGIAR and local partners have improved research capacity • Good coordination between the different research partners • Partners able to address weaknesses in research design and implementation	• Farmers and local researchers express confidence in research process • Smooth, functional relationships exist between CGIAR and NARS • Local actors benefit from and are able to access CGIAR expertise on a regular basis	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers

Research Objective 1: *Identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
What opportunities are there to improve partnerships? Are there other potential partnerships?	• Enthusiasm exists for expanded and new partnerships for research, community engagement, scaling, etc. • Potential exists for increasing coordination across and within the sites	• Partners currently external to Africa RISING seek opportunity to participate • Research partners are aware of and in dialogue with potential new partners • Partners across the sites show increased coordination • Strong collaboration exists between CGIAR system partners and activities	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers
To what extent are capacity building elements promoted throughout the research program? Are there other areas in which capacity building can be supported?	• Local partners express satisfaction at skills being developed through Africa RISING • Research capacity is being improved (at all levels) and developed (beyond "pure" agricultural research) in areas relevant to improving the lives of poor farmers	• Detailed capacity building plans exist at country level • Researchers at CGIAR and NARS show skills development • Farmers express confidence that their needs are understood holistically • Actors are supported to ensure that local agricultural market issues are understood and reflected in activities	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers

Research Objective 1: *Identify and evaluate demand-driven options for sustainable intensification, which contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
How well are gender, climate change and nutritional considerations integrated into the research program overall?	• Africa RISING research is holistic and considers all issues relevant to the well-being of smallholder farm households • Regional climate projections are considered and incorporated into research • Nutritional considerations, both value chains and cultural relevance, are considered and incorporated into research	• Women's *pro rata* contribution to livelihoods of specific target areas is reflected in the research portfolio • Women researchers and trainees are better represented in Africa RISING than they are in the relevant NARS • Constraints faced by women are incorporated into activity planning	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers

Exhibit A-2. Outcome Measure—Research Objective 2

Research Objective 2: *To evaluate, document, and share experiences with approaches for delivering and integrating innovation for sustainable intensification in a way that will promote their uptake beyond the Africa RISING action research sites*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
How effectively are research designs harmonized among partners across sites (within appropriate regional contexts)?	• Common and comparable research approaches exist across multiple research sites • Activities undertaken by CGIAR and NARS are complementary	• Functioning mechanisms exist for information sharing between sites • Research designs clearly articulated and resource knowledge sharing across sites • Program reporting reflects complementarity of activities	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers
How have the sites resolved the tension between standardization and contextual differences?	• Target communities express satisfaction that research is tailored to context • Research partners (CGIAR and NARS) are able to adjust research designs to specific local contexts	• Research partners are able to draw comparable results from contextually different research sites • Consistent monitoring and reporting systems are in place allowing for easy comparison	• Program and project reporting • CGIAR staff • Development partners • Compilation of data from reporting • KIIs and FGDs
What opportunities are there to encourage the application of research outcomes to appropriate, comparable sites? Both among Africa RISING research sites and beyond?	• Research results are being adopted and applied at new locations within Africa RISING and beyond • Research partners are utilizing Africa RISING-generated research outcomes with new partners (outside the Africa RISING "family")	• Research partners have strategies to action R4D and impact pathways • Strategies to encourage scale-up are documented and clearly articulated	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers

Exhibit A-3. Outcome Measure—Development Objective 1

Development Objective 1: *To create opportunities for smallholder farm households, within Africa RISING action research sites, to move out of poverty and improve their nutritional status—especially of young children and mothers—while maintaining or improving ecosystem stability*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
What are some of the more promising technology or innovation packages developed for adoption by smallholder farmers?	• Research partners have clear understanding of research sites showing promise in responding holistically to the needs of smallholder farm households • Research approach and results are understood by farmers	• Research partners have clear, user-friendly documentation in relation to promising technology packages • Farmers express ease at adopting technology • Farmers anticipate positive results from adoption • Resources for adoption are locally available	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers
What are the criteria used to define "promising" technology or innovation packages?	Across Africa RISING, common criteria have been identified and are applied by different research partners to define "promising" technology or innovation packages	• Criteria are clearly documented and understood • Third parties verify and validate criteria	• Program and project reporting • CGIAR staff • Development partners • Compilation of data from reporting • KIIs and FGDs
What are the similarities and differences in criteria among the different research sites?	Research partners are able to clearly explain different criteria being used across Africa RISING to measure "promising" technology	Criteria are clearly documented and understood	• Program and project reporting • CGIAR staff • Development partners • Compilation of data from reporting • KIIs and FGDs

Exhibit A-4. Outcome Measure—Development Objective 2

Development Objective 2: *To facilitate partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
To what extent has the impact pathway delineating the steps from field research through to scaling (dissemination and adoption) been mapped out and used by the different elements within Africa RISING?	Research partners are able to holistically describe the development challenge of different target communities, and demonstrate how their research will effectively navigate these challenges: input costs, soil quality, water access, pest management, gendered roles, etc.	• Clear and accessible documentation exists describing the impact pathway • Ability to identify and address obstacles along the impact pathway • Scaling plans have been developed	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers
In what ways have relevant partners (especially Missions and private sector) been engaged in the different stages along the impact pathway? What other partners could be engaged?	• Missions and private-sector partners are well informed of program/project strategies • Potential for inclusion for Missions, private sector and other partners • Research partners have lines of communication to potential partners not currently active in Africa RISING	• Missions and private-sector partners express satisfaction that they have sufficient information to believe that the proposed impact pathway is a valid development intervention • Potential for Missions to scale outcomes in their own scaling plans • Number of Mission buys-ins	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers

Development Objective 2: *To facilitate partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites*			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
What opportunities are there for current and potential partners to contribute further to Africa RISING?	Dialogue exists with potential "sustainable intensification" collaborators in relation to opportunities and challenges in expanding approaches and scaling up application, improving research practices, outcomes, capacity	• Research and development partners can clearly articulate strategies for enhancement of the Africa RISING approach • Strong and frequent dialogue exists with partners	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Small landholding farmers
What opportunities are there to maximize dissemination of technology or innovation packages to smallholder farmers?	Dialogue exists with potential "sustainable intensification" collaborators in relation to opportunities and challenges in expanding approaches and scaling up application	Development partner (actual or planned) take up of innovations as a livelihoods intervention	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers
What are some of the challenges to dissemination the project needs to address?	Dialogue exists with potential "sustainable intensification" collaborators in relation to opportunities and challenges in expanding approaches and scaling up application	Research and development partners can clearly articulate challenges being faced and strategies for enhancement of the Africa RISING approach	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers

Exhibit A-5. Outcome Measure—Questions Related to the Program's Organization and Structural Approach

Effectiveness of Program Organization and Structure in Supporting Achievement of Program Goal			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
How effectively have program leaders and managers communicated the program's strategic vision so that partners feel a part of the whole program?	• Partners at all levels of implementation express that their voice is heard in program planning • Mutual understanding of project goals	• Partners express satisfaction with partnerships and program communications approach • Third parties are aware of and engaged with Africa RISING	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions (U.S. and other) • Small landholding farmers
How well are the various administrative components harmonized across the sites? (Are information transfer between sites, sharing of lessons learned, and collaborations evident?)	• Program mechanisms are effective in facilitating knowledge and resource sharing between sites • Effective collaboration occurs between research sites	Partners express satisfaction with administrative processes	• Program and project reporting • CGIAR staff • Development partners • Compilation of data from reporting • KIIs and FGDs
Are there systems in place that allow for communication and transfer of data and information between the different sites? To those outside the program?	• Program mechanisms are effective in facilitating knowledge and resource sharing between sites • Other development actors access Africa RISING-generated information	• Communications strategy clearly understood (and carried out) across the program • Both partners inside and external to Africa RISING express ease at accessing program results	• Program and project reporting • CGIAR staff • Development partners • Compilation of data from reporting • KIIs and FGDs

Effectiveness of Program Organization and Structure in Supporting Achievement of Program Goal			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
What opportunities are there to improve harmonization and collaboration among the different partners and between the sites?	• Information exchange among "sustainable intensification" collaborators identifies opportunities and challenges in expanding approaches and scaling up application	• Partners express satisfaction with higher-level program management • Project management identifies and addresses communication and collaboration challenges proactively	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions
What are some of the challenges that the project needs to address to strengthen the different partnerships?	Research partners are able to articulate strengths and weaknesses of partnerships, with particular focus on how to initiate and strengthen engagement of partners along the impact pathway	• Internal and external partners express confidence that the program is appropriately structured and capable of navigating challenges • Identification of obstacles by project management team and proactive addressing of obstacles to functioning partnerships	• Compilation of data from reporting • KIIs and FGDs • Program and project reporting • CGIAR staff • Development partners • Local partners • Missions

Effectiveness of Program Organization and Structure in Supporting Achievement of Program Goal			
Evaluation Questions	**Outcomes**	**Outcome Measures**	**Data Collection Methods** **Principal Data Sources**
Is a data management system in place to collect, track and report on FTF and custom indicators, outputs, outcomes and impacts both vertically from the beneficiary level to the partner level to the policy level, and horizontally across the programs?	FTF Monitoring System and USAID requirements are being met	Bureau for Food Security satisfied with Africa RISING data compliance	• Compilation of data from reports • Qualitative analysis of KII and FGD results • Quantitative analysis of research reports (review of FTF Monitoring System) • Program and project reporting • CGIAR staff • Missions (U.S. and other) • Bureau for Food Security staff
Does the collection and reporting conform to USAID requirements?	FTF Monitoring System and USAID requirements are being met	Bureau for Food Security satisfied with Africa RISING data compliance	• Compilation of data from reports • Qualitative analysis of KII and FGD results • Quantitative analysis of research reports (review of FTF Monitoring System)

Annex B. Key Informant List

Location	4. Informant	5. Purpose	Interview Type
Ghana			
Accra	• USAID Mission • Center for Scientific and Industrial Research • International Food Policy Research Institute Ghana • International Water Management Institute • Heifer International • Ministry of Agriculture	• In-briefing and exit briefings with relevant USAID staff • Understand perspective and engagement of peak agricultural research body toward Africa RISING • Understand IPFRI Ghana areas of focus and current research trends • Interview in relation to IWMI role in Africa RISING in Ghana • Information gathering in relation to livestock issues in Ghana • Interview in relation to Africa RISING engagement of Ministry in Ghana	KII KII KII KII KII KII
Tamale	• Africa RISING Country Team • Savannah Agriculture Research Institute • Animal Research Institute ADVANCE • ATT • Department of Agriculture o Director o Head of Extension o "Women in Ag" • Department of Health (or Nutrition)	• In-briefing and exit briefings with IITA staff responsible for implementation of Africa RISING activities in Ghana • Interview of key agricultural research body in northern Ghana in relation to their role in Africa RISING • Interview of key agricultural research body in northern Ghana in relation to their role in Africa RISING • Interview of staff of U.S.-funded Agricultural Development and Value Chain Enhancement project to understand levels of engagement with Africa RISING • Interview of staff of U.S.-funded Agriculture Technology Transfer project to understand levels of engagement with Africa RISING • Interview in relation to program engagement of Ministry in Ghana • Interview in relation to program engagement of Extension workers • Interview in relation to program engagement of "women in agriculture" programming • Interview in relation to Africa RISING engagement of nutrition programming	KII KII KII KII KII KII KII KII KII

Location	4. Informant	5. Purpose	Interview Type
Northern Region	• R4D Platform Chair • Community Visits (3)	• Interview of R4D Platform Chair to determine context, issues and needs of platforms • Interviews of community members to identify needs, priorities and community engagement (2-4 per community, depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII FGD KII KII
Upper East Region	• R4D Platform Chair • Community Visits (3)	• Interview of R4D Platform Chair to determine context, issues and needs of platforms • Interviews of community members to identify needs, priorities and community engagement (2-4 per community depending on numbers of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII FGD KII KII
Upper West	• R4D Platform Chair • Community Visits (3)	• Interview of R4D Platform Chair to determine context, issues and needs of platforms. • Interviews of community members to identify needs, priorities and community engagement (2-4 per community depending on numbers of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Mali			
Bamako	• USAID Mission • Institut d'Economie Rurale • Africa RISING Coordinator Africa RISING Country Team • Wageningen University and Research Center	• In-briefing and exit briefings with relevant USAID staff • Understand levels of engagement and perspective of peak agricultural research body toward Africa RISING • Meetings on arrival and exit with Africa RISING Coordinator in Mali • In-briefing and exit meeting with Africa RISING staff responsible for implementation of Africa RISING activities in Mali, involving ICRISAT, ICRAF, AVRDC, ILRI • Interviews related to Wageningen University's research program and cooperation with Africa RISING in Mali	KII KII KII FGD KII
Koutiala	• Africa RISING Regional Manager • L'Association Malienne d'Eveil au Developpement Durable (AMEDD) • L'Association Malienne pour la Securite et la Souverainete Alimentaire (AMASSA) • Centre d'Appui a l'Autopromotion pour le Developpement • Community Visits (3)	• Interview related to Africa RISING programming and management in Koutiala • Interviews related to AMEDD support of Africa RISING activities in the Koutiala region • Interviews related to AMASSA support to nutrition programming in Koutiala • Interviews related to CAAD support of Africa RISING activities in the Koutiala region • Interviews of community members to identify needs, priorities and community engagement (2-4 per community depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Bougouni	• Africa RISING Regional Manager • Cooperatives of the Mouvement Biologique du Mali (MOBBIOM) • Le Groupe de Recherches d'Actions et d'Assistance pour le Developpement Communautaire (CRAADECOM) • Community Visits (3)	• Interview related to Africa RISING programming and management in Bougouni • Interviews related to MOBBIOM support of Africa RISING activities in the Bougouni region • Interviews related to GRAADECOM support to Africa RISING programming in Bougouni • Interviews of community members to identify needs, priorities and community engagement (2-4 per community depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII FGDs KII K

Location	4. Informant	5. Purpose	Interview Type
Ethiopia			
Addis Ababa	• USAID Mission • Ethiopian Institute of Agricultural Research • Africa RISING Coordinator • Africa RISING Country Team • Agricultural Growth Program (USAID) • New Alliance For Food Security and Nutrition (USAID) • Productive Safety Net Program • Graduation with Resilience to Achieve Sustainable Development (GRAD) • Sustainable Natural Resource Management Association (SUNAMA) (NGO) • Food Security and Environment Forum	• In-briefing and exit briefings with relevant USAID staff • Understand levels of engagement and perspective of peak agricultural research body toward program-supported farm-based • Meetings on arrival and exit with Africa RISING Coordinator in Ethiopia • In-briefing and exit meeting with Africa RISING staff responsible for implementation of activities in Ethiopia, involving ILRI, ICARDA, ICRAF, CIP, CIAT, IWMI, ILRI • Interview of staff of U.S.-funded Agricultural Growth Program to understand their project and levels of engagement with Africa RISING • Interview of staff of U.S.-funded New Alliance For Food Security and Nutrition program to understand their project and levels of engagement with Africa RISING • Interview of staff of the Government of Ethiopia's Productive Safety Net program to understand their program approach, partners and levels of engagement with Africa RISING • Interview of staff at GRAD (CARE) to understand their program approach, partners and levels of engagement with Africa RISING • Interview of staff at SUNAMA to understand their program approach, partners and levels of engagement with Africa RISING • Interview of Steering Committee members of this large NGO network	KII KII KII KII KII KII KII KII KII FGD

Location	4. Informant	5. Purpose	Interview Type
Amhara Region	• Africa RISING Regional Manager • Innovation Platform Chairperson • District Agricultural officials • Debre Birhan Agricultural Research Center • Community Visits (3-4)	• Interview related to Africa RISING programming and management • Interview of Innovation Platform Chair to determine context, issues and needs of platforms, and support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interview of key agricultural research body in region in relation to their role in Africa RISING • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community, depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Oromia	• Africa RISING Regional Manager • Innovation Platform Chairperson • District Agricultural officials • Sinana Agricultural Research Center • Hundie (LNGO) • Community Visits (3-4)	• Interview related to Africa RISING programming and management • Interview of Innovation Platform Chair to determine context, issues and needs of platforms and to support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interview of key agricultural research body in region in relation to their role in Africa RISING • Interview of Africa RISING partner NGO • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII KII KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Southern Nations, Nationalities and Peoples	• Africa RISING Regional Manager • Innovation Platform Chairperson • District Agricultural officials • Areka Agricultural Research Center • Worabe Agricultural Research Center • Wachamo University • Community Visits (3-4)	• Interview related to Africa RISING programming and management • Interview of Innovation Platform Chair to determine context, issues and needs of platforms and to support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interview of key agricultural research body in region in relation to their role in Africa RISING • Interview of key agricultural research body in region in relation to their role in Africa RISING • Interview of Africa RISING partner entity • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community, depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII KII KII KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Tigray	• Africa RISING Regional Manager • Innovation Platform Chairperson • District Agricultural officials • Tigray Agricultural Research Institute • Alamata Agricultural Research Center • SUNAMA (LNGO) • GRAD • Community Visits (3-4)	• Interview related to Africa RISING programming and management • Interview of Innovation Platform Chair to determine context, issues and needs of platforms, and support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interview of key agricultural research body in region in relation to their role in Africa RISING • Interview of key agricultural research body in region in relation to their role in Africa RISING • Interview of Africa RISING partner entity • Interview of local Africa RISING partner NGO • Interview of local Africa RISING partner project • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community, depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII KII KII KII KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Malawi			
Lilongwe	• USAID Mission • Malawi Department of Agricultural Research • Malawi Department of Agricultural Extension Services (DAES) • Africa RISING Country Team • Lilongwe University of Agriculture and Natural Resources (LUANAR) • Integrating Nutrition in Value Chains Project (USAID) • Strengthening Evidence-Based Agriculture Policy (SEBAP)	• In-briefing and exit briefings with relevant USAID staff • Interview to understand levels of engagement and perspective of peak agricultural research body toward Africa RISING • Interview to understand levels of engagement and perspective of peak agricultural research body toward Africa RISING • Meetings on arrival and exit with Africa RISING Coordinator in Malawi • In-briefing and exit meeting with Africa RISING staff responsible for implementation of activities in Malawi, involving IITA, Michigan State University, ICRAF, CIAT, IWMI, ILRI • Interview of LUANAR staff to understand their program and levels of engagement with Africa RISING • Interview of staff of U.S.-funded Integrating Nutrition in Value Chains Project to understand their project and levels of engagement with Africa RISING • Interview of staff of Strengthening Evidence-Based Agriculture Policy to understand their program approach, partners and levels of engagement with Africa RISING	KII KII KII KII FGD FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Ntcehu District	• Africa RISING Regional Manager • R4D Platform Chairperson • District Agricultural officials • Community Visits (4)	• Interview related to Africa RISING programming and management • Interview of R4D Platform Chair to determine context, issues and needs of platforms, and support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interview with Ag Extension Director in Ntcehu District • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII FGD KII KII
Dedza District	• Africa RISING Regional Manager • R4D Platform Chair person • District Agricultural officials • Community Visits (4)	• Interview related to Africa RISING programming and management • Interview of R4D Platform Chair to determine context, issues and needs of platforms, and support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interview with Ag Extension Director in Dedza District • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII FGD KII KII

Location	4. Informant	5. Purpose	Interview Type
Tanzania			
Dar Es Salaam	• USAID Mission • Tanzanian Institute of Agricultural Research • Africa RISING Coordinator • Africa RISING Country Team • Africa RISING Gender Specialist • Ministry of Agriculture, Food Security and Cooperatives • Ministry of Livestock Development and Fisheries • Tanzania Staples Value Chain—NAFAKA (USAID) • Tuborese Chakula (Lets Improve Food project (USAID)	• In-briefing and exit briefings with relevant USAID staff • Understand levels of engagement and perspective of peak agricultural research body toward Africa RISING • Meetings on arrival and exit with Africa RISING Coordinator in Tanzania • In-briefing and exit meeting with Africa RISING staff responsible for implementation of activities in Mali, involving IITA, CIAT, ILRI, AVRDC, CIMMYT • Interview of specialist responsible for providing gender support to the East and South Africa project • Interview of key government staff to determine priorities and levels of engagement with Africa RISING • Interview of key government staff to determine priorities and levels of engagement with Africa RISING • Interview of staff of U.S.-funded NAFAKA program to understand their project and levels of engagement with Africa RISING • Interview of staff of U.S.-funded Tuborese Chakula program to understand their project and levels of engagement with Africa RISING	KII KII KII FGD KII KII KII KII

Location	4. Informant	5. Purpose	Interview Type
Babati District	• Africa RISING Regional Manager • Innovation Platform Chair person • District Agricultural officials • Community Visits (-4)	• Interview related to Africa RISING programming and management • Interview of Innovation Platform Chair to determine context, issues and needs of platforms, and support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting Aprogram-supported farm-based trials	KII KII KII KII FGD KII
Kongwa/ Kiteto Districts	• Africa RISING Regional Manager • Innovation Platform Chair person • District Agricultural officials • Community Visits (3-4)	• Interview related to Africa RISING programming and management • Interview of Innovation Platform Chair to determine context, issues and needs of platforms, and support provided by Africa RISING • Interview in relation to Africa RISING engagement of Ag Department • Interviews of community members to identify needs, priorities and community engagement efforts by Africa RISING (2-4 per community, depending on number of people in attendance and translation capacity) • Interviews with male farmers conducting program-supported farm-based trials • Interviews with female farmers conducting program-supported farm-based trials	KII KII KII KII FGD KII KII

Annex C. Phase 1 Field Trip Itinerary

GHANA	
Time	**Action**
Thursday, 24 September	
	ET arrives in Accra
Friday, 25 September	
09:00-12:00	ET inception and planning meeting
14:00-16:00	In-briefing with USAID Mission
Saturday, 26 September	
	ET inception and planning meeting
Sunday, 27 September	
10:00-15:00	ET travels Accra-Tamale
15:00-18:00	Overview of Africa RISING West Africa/Ghana and discussions; IITA Office
Monday, 28 September	
08:30-09:30	Director of Savanna Agricultural Research Institute (SARI)
10:00-13:00	Field trip—Cheyohi No. 2 community, Tolon District, Northern Region
15:00-18:00	Field trip—Duko community, Salvelugu District, Northern Region
Tuesday, 29 September	
08:00-13:00	Field trip—Tibali community, Salvelugu District, Northern Region
14:00-18:00	Travel from Tamale to Bolgatanga, Upper East Region
Wednesday, 30 September	
08:30-13:00	Field trip—Bonia community, Kassena Nankana District, Upper East Region
14:00-17:00	Field trip—Gia community, Kassena Nankana District, Upper East Region
Thursday, 01 October	
08:00-13:00	Travel Bolgatanga (UER) to Wa, Upper West Region
13:30-18:00	Field trip—Zanko/Guo communities, Wa West district, Upper West Region
Friday, 02 October	
08:00-12:00	Field trip—Goli community, Nadowli District, Upper West Region
14:00-18:00	Travel from Wa to Tamale

GHANA	
Time	**Action**
Saturday, 03 October	
09:00-13:00	Debrief with IITI
14:00-16.00	Animal Research Institute
14:00-16:00	Allan Pineda of ADVANCE
Sunday, 04 October	
until 11:00	ET meeting and Report writing
11:00-15:00	Travel Tamale to Accra
Monday, 05 October	
08:00-08:45	Tara Moses—Agricultural Technology Transfer project
10:00-12:00	Deputy Director General Centre for Scientific and Industrial Research
15:00-16:00	Exit briefing at USAID Mission
16:00-17:00	Heifer International
16:00-17:00	Women in Agriculture Department
Tuesday, 06 October	
09:00	Check out of hotel and transfer to airport
10:00-17:00 (13:15 departure)	Travel Accra to Bamako, Mali via Lome, Togo

MALI	
Time	**Action**
Tuesday, 06 October	
	Team arrival in Mali
Wednesday, 07 October	
	Attend Africa RISING Strategy Workshop Meeting in Bamako
Thursday, 08 October	
	Attend Africa RISING Strategy Workshop Meeting in Bamako
Friday, 09 October	
	Attend Africa RISING Strategy Workshop Meeting in Bamako
Saturday, 10 October— - FIELD VISIT GROUP 1 - Bougouni	
08:30-11:00	Travel to Bougouni
11:00-12:00	Welcome at MoBiOM Office in Bougouni
12:00-13:00	Lunch
13:00-17:30	Visit Flola Technology Park - Discussion with farmers and partners (MOBIOM, GRAADECOM, ICRISAT, ICRAF, ILRI & AVRDC)
Sunday, 11 October	
08:30-5:00	Visit Africa RISING activities in Dieba and discussion with farmers and partners (MOBIOM, GRAADECOM, ICRISAT, ICRAF, ILRI & AVRDC)
Monday, 12 October	
08:30-5:00	Visit Africa RISING activities in Sibirila and discussion with farmers and partners (MOBIOM, GRAADECOM, ICRISAT, ICRAF, ILRI & AVRDC)
Tuesday, 13 October	
08:30-12:00	Debriefing and discussion with partners at MoBioM office
12:00-13:30	Lunch
13:30-17:00	Travel to Bamako

MALI	
Time	**Action**
Saturday 10 October—FIELD VISIT GROUP 2 - Koutiala	
08:30-12:00	Debriefing and discussion with partners at MoBioM office
12:00 to 13:30	Lunch
13:30-17:00	Travel to Bamako
Sunday, 11 October	
08:30-12:00	Visit M'Pessoba Technology Park- Discussion with farmers and partners (AMEDD, AMASSA, CAAD, ICRISAT, ICRAF, ILRI, AVRDC)
12:00-13:30	Lunch
13:30-17:00	Discussion with partner Institutions and preparing for next day field visit
Monday, 12 October	
08:30-15:00	Visit Africa RISING activities in N'Golognanasso and discussion with farmers (AMEDD, AMASSA, CAAD, ICRISAT, ICRAF, ILRI, AVRDC)
Tuesday, 13 October	
07:30-12:00	Visit Africa RISING activities in Sirakele and discussion with farmers (AMEDD, AMASSA, CAAD, ICRISAT, ICRAF, ILRI, AVRDC)
12:00-12:30	Lunch
12:30-14:30	Debriefing and discussion with partner institutes at AMEDD office
14:30-18:30	Travel to Bamako
Wednesday, 14 October	
09:00-12:00	Debriefing with CG partners
12:00-13:00	Lunch
13:00-17:00	ET debriefing
Thursday, 15 October	
	Departure

Annex D. Phase 2 Field Trip Itinerary

ETHIOPIA		
Date	**Option One**	**Location overnight**
Friday, 05 February	Team arrival Addis Ababa	Solo Te Hotel, Addis Ababa
Saturday, February 06	> Team planning	Solo Te Hotel, Addis Ababa
Sunday, 07 February	> Travel to Debre Birhan, Amhara region > Briefing from Africa RISING Amhara team	Solo Te Hotel, Addis Ababa
Monday, 08 February	> Field work Basona Worena woreda (Gudo Beret kebele)	Eva Hotel, Debre Birhan
Tuesday, 09 February	> Field work Basona Worena (Goshe Bado kebele) > Return Addis Ababa > Entry briefing with CG Partners active in Africa RISING—at ILRI > Meeting with Tracy Powell, USAID	Solo Te Hotel, Addis Ababa
Wednesday, 10 February	> Attend Africa RISING 2 planning meeting of Africa RISING staff in Addis (AM) > Briefing with Sinana Innovation Platform members (in Addis Ababa) > Briefing with Tigray team (in Addis Ababa), including site coordinator and Innovation Platform members > Travel to Goba, Oromia region (GS and WF)	Solo Te Hotel, Addis Ababa (SR and TW) Wabe Shebelle Hotel, Goba/Bale (GS and WF)
Thursday, 11 February	> Travel to Sinana woreda, Oromia region (SR & TW) > Field work in Ilu Santibu kebele (GS and WF) > Briefing with Africa RISING Oromia team	Wabe Shebelle Hotel, Goba/Bale
Friday, 12 February	> Field work in Salka kebele > Meeting with Sinana Ag Research Centre > Debrief with Africa RISING Oromia team	Wabe Shebelle Hotel, Goba/Bale
Saturday, 13 February	> Travel to Hosanna, SNNP > Briefing from local SNNP staff/ stakeholders	Shembelela Hotel, Hosanna
Sunday, 14 February	Day Off	Shembelela Hotel, Hosanna
Monday, 15 February	> Field work Lemo woreda—Jawe kebele	Shembelela Hotel, Hosanna
Tuesday, 16 February	> Field work Lemo woreda—Upper Gana kebele > Return to Addis Ababa	Solo Te Hotel, Addis Ababa
Wednesday, 17 February	> Debrief with Africa RISING team > Other Addis meetings	Solo Te Hotel, Addis Ababa

MALAWI		
Date	**Option One**	**Location overnight**
Thursday, 18 February	> Fly at 10:00, Addis to Lilongwe > Arrive Lilongwe 12:45 > 15:00 Meet with Integrated Nutrition Value Chain project (USAID/FTF funded)	Crossroads Hotel, Lilongwe
Fri day, 19 February	> Briefing with Africa RISING Malawi country team > Meet with Department of Ag Research > Meet with Lilongwe University of Agriculture and Natural Resources (LUANAR) vice chancellor > Meet with LUANAR faculty members active in Africa RISING > Meet with LUANAR MSc AR scholarship recipients	Crossroads Hotel, Lilongwe
Saturday, 20 February	> Travel to Dedza District > Briefing from local Africa RISING Dedza team > Field work in Dedza (Linthipe Extension Planning Area)	Dedza Pottery Lodge, Dedza
Sunday, 21 February	> Field work in Dedza (Linthipe extension planning area) > Meeting with Linthipe Dairy Cooperative	Dedza Pottery Lodge, Dedza
Monday, 22 February	> Field work in Dedza (Golomoti extension planning area)	Dedza Pottery Lodge, Dedza
Tuesday, 23 February	> Meet with Dedza Innovation Platform > Meeting with Agro-Industry > Evaluation team meeting	Dedza Pottery Lodge, Dedza
Wednesday, 24 February	> Field work in Ntcheu (Kandeu extension planning area)	Dedza Pottery Lodge, Dedza
Thursday, 25 February	> Field work in Ntcheu (Nsipe extension planning area) > Meet with Ntcheu R4D Platform	Dedza Pottery Lodge, Dedza
Friday, 26 February	> Return to Lilongwe > Debrief with USAID (Martin Banda) > Meeting with IFPRI (Noora-Lisa Aberman)	Crossroads Hotel, Lilongwe
Saturday, 27 February	> Debrief with Africa RISING Malawi team > Depart Lilongwe 14.35 > Arrive Arusha 23.20	Arusha

TANZANIA		
Date	**Option One**	**Location overnight**
Sunday, 28 February	> Arrive Arusha 01:30 > In-briefing with Africa RISING ESA team > Mateete Bekunda (chief scientist) > Patrick Okori (ICRISAT lead—Kongwa/Kiteto) > Gender specialist (Gundula Fischer), > GIS (Francis Muthoni), > IFPRI (Apurba Shee)	Arusha
Monday, 29 February	> Meeting Meru Agro (seed company) > Travel to Selian Agricultural Research Institute > Meeting with admin and partner researchers > Visit MLN lab and field experiment at Selian > Travel to Babati > Meet Babati R4D Platform	Ango Hotel, Babati
Tuesday, 01 March	> Meet Babati District Administration > Meet with District executive director > Field visit 1 = Long Village	Ango Hotel, Babati
Wednesday, 02 March	> Field visit 2 = Matufa Village > Field visit 3 = Hallu Village	Ango Hotel, Babati
Thursday, 03 March	> Field visit 4 = Seloto Village > PM drive to Dodoma (5-6 hour drive)	Morena Hotel, Dodoma
Friday, 04 March	> Meeting Kongwa Agriculture and District Administration > Meeting with Kongwa and Kiteto R4D Platform > Field visit 5 = Mlali Village	Morena Hotel, Dodoma
Saturday, 05 March	> Field visit 6 = Moleti village > Group meeting with Kongwa farmers	Morena Hotel, Dodoma
Sunday, 06 March	> Rest day	Morena Hotel, Dodoma
Monday, 07 March	> Meeting Kiteto District Administration > Travel to Morogoro	Arc Hotel, Morogoro
Tuesday, 08 March	> Meetings with Sokoine University of Agriculture nutrition department > Meeting with Africa RISING representative embedded in NAFAKA > Meeting with NAFAKA management team (ACDI-VOCA) > Travel to Dar Es Salaam	Hotel, Dar Es Salaam
Wednesday, 09 March	> Debrief with Chief Scientist and Africa RISING Tanzania team (including meeting with Elizabeth Maeda, USAID) > Departure	

Annex E. Key Informant Interview and Focus Group Protocols

A challenge for this evaluation is ensuring a sufficiently nuanced and textured approach that captures location-specific achievements, while also ensuring information is gathered that allows for conclusions to be reached on the state of the program "whole." The approach also needs to accommodate the fact that the evaluation team will only be able to directly see a fraction of the overall program effort.

The proposed evaluation approach is to ensure sufficient flexibility to better understand and appreciate the multilayered diversity of the AR program, since an expectation is that there will be significant variance in performance across the program. Each research site is different from the other, in terms of the how and why of its commencement; the approach being applied; the degree to which it has advanced; the degree to which local communities engage the research; the degree and frequency to which AR engages each community; its socio-economic context; its ecological context; the capacity building approach employed; and many other factors.

Having said that, there are stakeholder types common across the program:

- Lead Agencies
  - IITA
  - ICIRSAT
  - ILRI
- Partners
  - Research partners
    - CG researchers
    - NARS
  - Development partners

- Farming Communities
  - Farmer-based organizations
  - Farmers participating at trial sites
    - Men farmers
    - Women farmers

The following KII guides are sets of key questions relevant to the different stakeholder types, framed around the questions outlined in the Scope of Work. The aim of the KIIs is to ensure that the overall program logic is tested at each site in a consistent form, while ensuring sufficient flexibility to explore local context and nuance.

1. Key Informant Interviews Lead Agencies – IITA, ILRI, ICRISAT

Start Up

Can you describe the start-up period of Africa RISING and your role in setting its approach and focus? What was your Institute's role in initiating AR? Was it active or proactive? What was your role in setting the overall approach and focus?

What was the process involved in identifying research areas to be supported by the program? To what extent would you describe them to be "demand driven"? Has the nature of "demand driven" changed over time?

How would you describe the position/contribution of AR within the broader program of work of your agency? Does AR benefit from your broader program, and vice versa? How has AR impacted your Institute's program?

Can you provide examples of how AR has BUILT upon knowledge previously generated through your Institute?

Is the existing program structure the best possible fit for achievement of program objectives?

Research Approach

To what extent was past adoption, improved technologies and government recommendations reflected in your choice of specific research areas?

What protocols exist for documentation of research results?

Is an inventory of on-station and on-farm results maintained? If so, where and how is it accessed by different partners?

Are experiments evaluated both statistically and economically?

What processes are in place for validation of results? How common is it for results to be published? Are social scientists participating/active in validation processes e.g. health, nutrition, gender?

What is the approach employed in terms of ensuring farmers feel an active role in the research process, and validating efficacy of trials?

How effectively do the different research partnerships contribute toward a rigorous process and quality research outcomes?

How have you resolved the tension between standardization and contextual differences at/across the different research sites?

Partnerships

What was the approach to mobilizing partnerships in support of the research?

What is your role as lead agency in management and monitoring of sub-grantees?

Are development partners sufficiently active in the program? Are they effective in supporting behavior change? Do they strengthen responses on issues such as nutrition and gender?

What in your mind is an ideal partnership composition in support of 'sustainable intensification'? Why?

What have been the strengths/weaknesses and challenges/successes in terms of maintaining effective partnerships?

Is turnover of staff a constraint undermining partnership development?

Are you satisfied that there is sufficient national ownership of the research program? What indicators exist of strong national ownership?

What opportunities are there to improve partnerships? Are there other potential partnerships?

Inclusion

To what extent are capacity building elements promoted throughout the research program?

- National partners
- Development partners
- Farmer-based organizations
- Farmers
- Private sector/input dealers

Has there been changes over time in levels of participation – good and bad? Have R4D platforms motivated greater participation?

Do you have specific approaches in place to support women farmers? Can you describe your approaches for ensuring women feel included within the program approach?

Do you have specific approaches in place to foster youth participation in the program? Can you describe?

M&E and performance

Overall, are you satisfied that the program is on track to provide results that are relevant to the needs of small landholders?

What have been standouts? Can AR claim programmatic attribution for these achievements?

Are levels of uptake in communities in line with your expectations? If so, why is this and if not, why not?

What are the key ingredients to successful 'research for development' outcomes in your mind?

What roles exist for local actors to contribute to performance monitoring and assessment?

Do you observe significant variation in terms of performance across the portfolio?

How do you measure and define success of AR activities?

What mechanisms do you have in place for program monitoring? Is the program M&E model effective to your needs?

Are M&E and data management systems effective in sharing information between partners? Are they effective in fine tuning approaches? Examples?

Do you feel M&E would be more effective if internalized within your Institute?

In particular, is there clarity of roles between CGs and IFPRI in M&E?

Are you comfortable with IFPRI evaluation approach. IFPRI stipulates that monitoring (are targets being achieved?) and evaluation (is the impact pathway progressing sufficiently?) are different. ***** What is monitoring approach? What is eval approach?

Communication

What strategy exist for dissemination of AR results within AR and external of AR?

Are there examples of results dissemination leading to technology uptake by external parties?

Given low levels of education amongst many farming communities, what strategies do you employ to ensure effective communication with farmers?

Do you have a specific strategy for proactively promoting results with potential new partners or relevant organizations?

Do you have a line of communication to:

- USAID missions in the region?
- Other relevant U.S. programs in the country and region?

Moving Forward

Is the current AR program structure an appropriate for optimum achievement of program objectives?

- Three different projects, no coordinating role?
- Supporting mechanisms such as Scientific Advisory Group
- Program Coordination Team – with rotating chair
- Steering committee

What changes would strengthen the program moving forward?

2. Key Informant Interviews for Research Partners (sub-grant recipients)

Start Up
Can you describe how you first became involved in Africa RISING?

What was the process involved in identifying the research area you work on? To what extent would you describe your work to be 'demand driven'?

How would you describe the position/contribution of AR within the broader program of work of your agency? Does AR benefit from your broader program, and vice versa? How has AR impacted your Institute's program?

Does your work with AR has BUILT upon knowledge previously generated through your Institute? Can you provide examples?

In your perspective, is the existing program structure the best possible fit for achievement of program objectives?

- Lead Agency
- Sub-contracting
- IFPRI M&E role
- Knowledge sharing

Research Approach
Can you explain your research relationship with other partners?

To what extent were past adoption, improved technologies and government recommendations reflected in your choice of specific research areas?

What protocols exist for documentation of research results?

Is an inventory of on station and on farm results maintained? If so, where and how is it accessed by different partners?

Are experiments evaluated both statistically and economically?

What processes are in place for validation of results? Have you had any of your results published? Are social scientists participating/active in validation processes e.g. health, nutrition, gender?

What is the approach employed in terms of ensuring farmers feel an active role in the research process, and validating efficacy of trials?

What specific efforts are being done to preserve/improve the natural resource base?

Do you see the need for strategic research on SI and on production variability? If so, what would be the priorities for that type of research?

Partnerships

What was the approach to mobilizing partnerships in support of your research?

Describe your working relationship with the lead agency (ITTA/ILRI/ICRISAT)

How effectively do the different research partnerships contribute toward a rigorous process and quality research outcomes?

Do you believe development partners sufficiently active in the program? Are they effective in supporting behavior change? Do they strengthen responses on issues such as nutrition and gender?

What in your mind is an ideal partnership composition in support of 'sustainable intensification'? Why?

What have been the strengths/weaknesses and challenges/successes in terms of maintaining effective partnerships?

Is turnover of staff a constraint undermining partnership development?

Are you satisfied that there is sufficient national ownership of the research program? What indicators exist of strong national ownership?

What opportunities are there to improve partnerships? Are there other potential partnerships?

Inclusion

To what extent has capacity building been a component of the research approach?

- National partners
- Development partners
- Farmer-based organizations
- Farmers
- Private sector/input dealers

Have there been changes over time in levels of participation – good and bad? Have R4D platforms motivated greater participation with your work?

Do you have specific approaches in place to support women farmers? Can you describe your approaches for ensuring women feel included within the program approach?

Do you have specific approaches in place to foster youth participation in the program? Can you describe?

M&E and performance

Overall, are you satisfied that the program is on track to provide results that are relevant to the needs of small landholders?

Are levels of uptake in communities in line with your expectations? If so, why is this and if not, why not?

What are the key ingredients to successful 'research for development' outcomes in your mind?

What roles exist for local actors to contribute to performance monitoring and assessment of your work?

How do you measure and define success of AR activities?

What mechanisms do you yourself have in place for activity monitoring? Is the program M&E model effective to your needs?

Are M&E and data management systems effective in sharing information between partners? Are they effective in fine tuning approaches?

Have you benefited from knowledge being generated through other AR activities?

Do you feel M&E would be more effective if internalized within your Institute?

In particular, is there clarity of roles between you, the CG and IFPRI in relation to M&E?

Communication

What strategies are in place for dissemination of results?

Are there examples of results dissemination leading to technology uptake by external parties?

Given low levels of education amongst many farming communities, what strategies do you employ to ensure effective communication with farmers?

Do you have a specific strategy for proactively promoting results with potential new partners or relevant organizations?

Do you have any lines of communication to:

- USAID missions in the region?
- Other relevant US programs in the country and region?

Moving Forward

Is the current AR program structure appropriate for optimum achievement of program objectives?

- Three different projects, no coordinating role?
- Supporting mechanisms such as Scientific Advisory Group
- Program Coordination Team – with rotating chair
- Steering committee

What changes would strengthen the program moving forward?

3. Focus Group Discussions with Community participants

Start Up

Can you describe the crops and farming approaches you are practicing?

What new technologies have you adopted on your farm BEFORE AR?

What are the technologies promoted by AR that you are most interested and active in?

How did you first become aware of the Africa RISING project?

Why did you decide to become involved in the project? What did you hope to get from the program?

What were you doing differently before the trial started?

Who are the people you have most contact with in relation to the trial?

Can you describe your level of involvement?

Research Approach

To what extent was past adoption, improved technologies and government recommendations reflected in your choice of specific research areas?

What protocols exist for documentation of research results?

Is an inventory of on station and on farm results maintained? If so, where and how is it accessed by different partners?

Are experiments evaluated both statistically and economically?

What processes are in place for validation of results? How common is it for results to be published? Are social scientists participating/active in validation processes e.g. health, nutrition, gender?

What is the approach employed in terms of ensuring farmers feel an active role in the research process, and validating efficacy of trials?

How effectively do the different research partnerships contribute toward a rigorous process and quality research outcomes?

How have you resolved the tension between standardization and contextual differences at/across the different research sites?

Partnerships

What was the approach to mobilizing partnerships in support of the research?

What is your role as lead agency in management and monitoring of sub-grantees?

Are development partners sufficiently active in the program? Are they effective in supporting behavior change? Do they strengthen responses on issues such as nutrition and gender?

What in your mind is an ideal partnership composition in support of 'sustainable intensification'?

What have been the strengths/weaknesses and challenges/successes in terms of maintaining effective partnerships?

Is turnover of staff a constraint undermining partnership development?

Are you satisfied that there is sufficient national ownership of the research program? What indicators exist of strong national ownership?

What opportunities are there to improve partnerships? Are there other potential partnerships?

Inclusion

To what extent are capacity building elements promoted throughout the research program?

- National partners
- Development partners
- Farmer-based organizations
- Farmers
- Private sector/input dealers

Has there been changes over time in levels of participation – good and bad? Have R4D platforms motivated greater participation?

Do you have specific approaches in place to support women farmers? Can you describe your approaches for ensuring women feel included within the program approach?

Do you have specific approaches in place to foster youth participation in the program? Can you describe?

M&E and Performance

Overall, are you satisfied that the program is on track to provide results that are relevant to the needs of small landholders?

What have been stand outs? Can AR claim programmatic attribution for these achievements?

Are levels of uptake in communities in line with your expectations? If so, why is this and if not, why not?

What are the key ingredients to successful 'research for development' outcomes in your mind?

What roles exist for local actors to contribute to performance monitoring and assessment?

Do you observe significant variation in terms of performance across the portfolio?

How do you measure and define success of AR activities?

What mechanisms do you have in place for program monitoring? Is the program M&E model effective to your needs?

Are M&E and data management systems effective in sharing information between partners? Are they effective in fine tuning approaches? Examples?

Do you feel M&E would be more effective if internalized within your Institute?

In particular, is there clarity of roles between CGs and IFPRI in M&E?

*Are you comfortable with IFPRI evaluation approach. IFPRI stipulates that monitoring (are targets being achieved?) and evaluation (is the impact pathway progressing sufficiently?) are different. ***** What is monitoring approach? What is eval approach?*

Communication

What strategy exist for dissemination of AR results within AR and external of AR?

Are there examples of results dissemination leading to technology uptake by external parties?

Given low levels of education amongst many farming communities, what strategies do you employ to ensure effective communication with farmers?

Do you have a specific strategy for proactively promoting results with potential new partners or relevant organizations?

Do you have a line of communication to:

- USAID missions in the region?
- Other relevant US programs in the country and region?

Moving Forward

Is the current AR program structure an appropriate for optimum achievement of program objectives?

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What changes would strengthen the program moving forward?