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The Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will 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.

The three regional projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads the program's monitoring, evaluation and impact assessment. <http://africa-rising.net/>



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Terminology and acronyms

PCT:	Program Coordination Team
PSC:	Project Steering Committee
MET:	Monitoring and Evaluation Team
PRF:	Program Research Framework
IFPRI:	International Food Policy Research Institute
IITA:	International Institute for Tropical Agriculture
ILRI:	International Livestock Research Institute
M&E:	Monitoring and evaluation
NARS:	National Agricultural Research Systems
SI:	Sustainable Intensification

1. Summary

The Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will 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.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

This document outlines the underlying principles of and implementation plan for the research that will be undertaken by the three Africa RISING projects in West Africa, Eastern and Southern Africa and the Ethiopian highlands. Research is undertaken in Ethiopia, Ghana, Malawi, Mali, Tanzania and Zambia.

In developing this program, we have identified approaches that will ultimately deliver against its purpose of providing pathways out of hunger and poverty through sustainable intensification (SI). These approaches are not designed to be entirely prescriptive, allowing individual research teams to build on their past experience and to exercise their creativity in developing workable solutions to farmers' problems. Key features of the program are:

- The research conducted will be designed to test a set of hypotheses that are carefully linked to outputs and associated developmental outcomes identified by the Africa RISING program.
- Its research activities will be problem-focused and driven by changes in market demand, evolving policy environments (e.g. food security and environmental mitigation) and changing social structures (resulting from migration / urbanization etc.). It will also meet the needs of farmers. These activities will support the integration of SI-related innovations from a wide range of sources (past research, ongoing adaptive research and indigenous solutions) into the farming systems that are targeted.
- It is built on a set of guiding principles that will help to ensure that its research outputs are targeted effectively on development needs and are feasible for target farm households to implement. These principles include an appreciation of household diversity, differing and multiple objectives, complementarity of interventions / innovations and the dynamic nature of intensification at the household level.
- It is implemented at several levels with core research outputs that are likely to be common across the program; research activities that may or not be relevant to all of the research questions posed by the individual projects; methods and tools that can be applied flexibly as dictated by these individual research activities and the context in which they are to be carried out.
- Scaling will be embedded in the program, at a pilot level (within the program's budget) and beyond through the development of investment plans with development agencies. Some of these opportunities are already emerging through initial discussions with other partners and donors.

This research approach has been designed to be effective in addressing the continuum from problem identification and targeting through to scaling. It has been designed with clear objectives and outputs that are built on testable and refutable hypotheses.

2. Context: Opportunities and Constraints

Rural livelihoods in the savannah zones and humid areas of West and East Africa, including the Ethiopian Highlands are based on smallholder crop and livestock production systems. As a result of population growth and increasing food and feed needs, these farming systems are, to varying degrees, in transition. At the household level, they vary from sole crop and livestock enterprises to highly integrated crop-livestock systems. Even individual households that are engaged exclusively in crop or livestock production are often subject to significant crop-livestock interactions within their communities and across the landscape.

Constraints

Productivity is generally low, limited by a lack of improved technologies and knowledge and skills to adopt and apply these, poor capacity of farmers to innovate, limited access to production resources and their efficient allocation and market inefficiencies. Agricultural communication and policy environments are not always sufficiently pro-poor and local, regional and national institutions are not always effective. In spite of an awareness of the need for mitigation measures various environmental pressures are becoming more acute. At the household level, this situation has increased food insecurity and other risks and vulnerabilities. Disadvantaged groups – particularly women – in rural areas are often finding it increasingly difficult to meet basic household needs let alone to make any more than a living.

The following constraints to smallholder rainfed crop production informed the development of Africa RISING's research priorities:

Biophysical constraints	Economic, social and institutional constraints
<ul style="list-style-type: none"> • Access to increasingly scarce natural (i.e. land and water bound) resources; • Dependence on rainfall, which can be erratic and unpredictable, exacerbated by recurrent droughts; • Lack of replicable, low-risk development trajectories for the most resource poor; • Low productivity limited adoption of improved crops and cropping practices; • Low nutrients and water use efficiencies; • High storage losses; • Loss of biodiversity and land cover and soil erosion. 	<ul style="list-style-type: none"> • Lack of affordable technologies whose use results in profitable production; • Lack of knowledge of improved and appropriate technologies for agricultural production and child nutrition; • Lack of input markets (inputs, particularly quality seed and livestock feed / medications) and output market; • Lack of efficient labor markets, including employment or other income generating activities; • Lack of access to formal credit; • Lack of secure land tenure and property rights; • Low labour use efficiency; • Lack of credit markets; • Lack of risk management markets; • Lack of mechanisms to internalize externalities; • Low incomes limit capacity to accumulate capital to expand production enterprises; • Inequity and a lack of empowerment within communities and households; • Policy environments that do not always promote sustainable land management practices (at all scales); • Weak institutions that facilitate and advocate for rain-fed farming families; • Capacity of information providers to rural populations limited, especially with respect to agricultural innovations.

In addition, all these constraints are vulnerable to the impacts of external shocks and the long term consequences of environmental change. This indicates a need for flexible and, even more importantly, adaptable solutions to the problems that farmers face.

Opportunities

Africa RISING will focus on multiple dimensions of hunger (food supply and nutritional adequacy) and food security (stable food production and income generation). At the household level, the project will address core opportunities that are built around:

- The potential for increased agricultural production;
- Improved productivity and environmental sustainability through better resource management;
- Additional increased resilience through alternative income generating activities and stronger market participation;
- Improved knowledge of child nutrition;
- Improved food safety.

These opportunities are being driven by growth in demand for food and feeds that are likely to support predicted expansions in food production; particularly for livestock on non-staples. Food diversification also presents opportunities for diversification at the farm level in order to meet new patterns of demand.

In terms of research paradigms, a greater awareness amongst research and development professionals of the importance of the contexts that are required for successful innovation at the household level is likely to lead to higher adoption rates and more widespread development outcomes. Successful implementation of these approaches can be facilitated by a stronger focus on input supply systems (e.g. seed, fertilizer, feed), export markets (internal, regional and international) and multi-stakeholder partnerships. At the community / institutional scales, emerging environmental payment schemes (carbon payments) may offer opportunities for underpinning widespread improvement in food security albeit through different impact pathways.

The research approaches proposed by the program cover the spectrum from on-station and on-farm trials, household livelihoods approach, community-based, participatory research and quasi-experimental research approaches as well as integrated system approaches. These have been designed to identify and promote appropriate technological, institutional and policy options that can capitalize upon these opportunities. Broader development outcomes of the approach should include more sustainable household livelihood strategies, including wider and more reliable participation in markets as well as increased capacity of households in the target communities to assure their own food security.

3. Purpose

The overall aim is to provide pathways out of hunger and poverty for small holder 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.

4. Objectives and Outcomes

To emphasize the research for development nature of Africa RISING, the program proposes four research- and development-oriented objectives and outcomes.

Research objectives

1. To identify and evaluate demand-driven options for sustainable intensification, that contribute to rural poverty alleviation, improved nutrition and equity and ecosystem stability [H1, H2, H3, H4].
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 [H5].

Development objectives

3. 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 [H5].
4. To facilitate partner-led dissemination of integrated innovations for sustainable intensification beyond the Africa RISING action research sites [H5].

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 SI leads to similar impacts beyond the Africa RISING action research sites.

Program-level development outcomes

4. 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.
5. The development community initiates programs, based on the knowledge tools and innovations developed and promoted by Africa RISING, that are directed at developmental goals that are consistent with the Africa RISING program purpose.

5. Guiding Principles

Farm and household as focal domains

The farm household¹ scale is the focal domain for Africa RISING's investments and activities. This is the scale at which household production decisions, gender and nutrition issues, and household welfare as well as soil health and productivity issues operate. It is conditioned by assets (e.g. land, labor, livestock, and financial resource endowments), livelihood strategies, production objectives and aspirations of households within the broader regional and landscape context. Research activities at this scale need to focus on understanding household needs and incentives in to support effective evaluation, adoption and adaptation of the most relevant interventions. Within the constraints and opportunities of the regional and landscape context, the goal of Africa RISING is to offer menus of relevant and cost-effective integrated SI innovations² that simultaneously advance household welfare and enhance sustainability. The household is equally the primary intervention domain of the CGIAR humid tropics research program with which the Africa RISING is aligned.

Sustainable intensification

Africa RISING aims to sustainably intensify key cereal-based farming systems. FAO has technically defined 'agricultural intensification' as an 'increase in agricultural production per unit of inputs (which may be labour, land, time, fertilizer, seed, feed or cash)' (FAO, 2004). More recently, 'sustainable intensification' has been defined as 'producing more output from the same area of land while reducing the negative environmental impacts and at the same time increasing contributions to natural capital and the flow of environmental services' (Pretty et al, 2011).

'Eco-efficiency' was a concept first used in the business domain in the lead-up to the 1992 Rio Earth Summit. In this context, it was defined as, 'creating more goods and services with ever less use of resources, waste and pollution'.

Keating et al (2012) sought to explore the conceptual underpinnings of eco-efficiency in agricultural systems and emphasize its multi-dimensional nature whereby any output measure (desired, such as food production or undesired, such as nutrient pollution or greenhouse gas emissions) is related to some measure of inputs (such as land, water, nutrients or labour) (Figure 1).

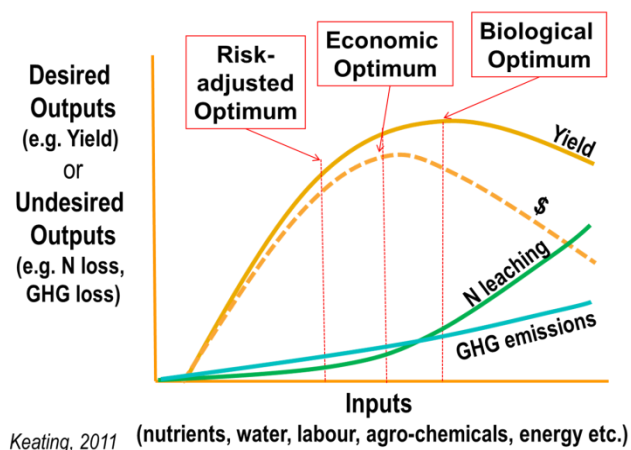


Figure 1: Illustration of the principles underlying sustainable intensification. Source: Keating et al, 2012.

The concept allows for relations between desired outputs (food production, labour employment) to be expressed in terms of undesired outputs (greenhouse gas emissions, risk, pollution etc.). The concept also acknowledges the issue of risk aversion within the context of promoted, integrated SI innovations. Africa RISING will use agro-ecological intensification principles for the quantitative evaluation of such innovations

¹ 'Farm households' within Africa RISING are defined as a group of people that work and live at least half of the time on the farm and operates under the leadership of a household head.

² 'Integrated SI innovations' refers to 'Integrated Innovations for Sustainable Intensification' and can include (combinations of) technological innovations (e.g., improved varieties, appropriate fertilizers, better agronomic practices), social (e.g., collective action for NRM or marketing), or institutional innovations (e.g., value chain efficiency improvements).

and will develop tools for linking desired and undesired outputs in order to prioritize these and enable trade-off analysis. In the rest of the document it is understood that where the term ‘sustainable intensification’ is used, this follows agro-ecological principles.

Stepwise progress towards sustainable intensification

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. Africa RISING also acknowledges that some components are required before other components can be promoted (e.g., there is no point in using fertilizer if a maize variety is not resistant to Striga in Striga-infested areas). Integrated Soil Fertility Management (ISFM), for instance, respects the principles of agro-ecological intensification and acknowledges that several steps can be taken to gradually move towards maximum agronomic efficiency of inputs used, the main goal of ISFM (Figure 2). ISFM also acknowledges that ‘moving towards full ISFM’ can only happen in combination with enhanced access to knowledge. A similar logic could apply to other innovations investigated by Africa RISING, including livestock intensification or value addition.

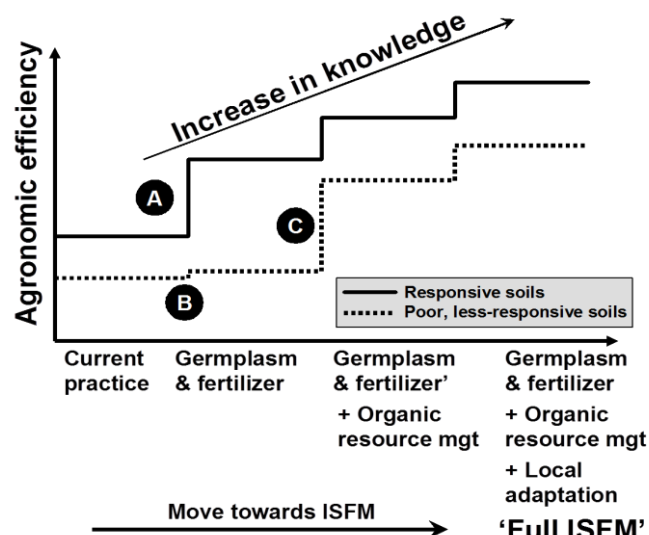


Figure 2: Conceptual illustration of the principles underlying Integrated Soil Fertility Management (ISFM) as an illustration of the need to move towards sustainable systems in a stepwise approach. Source: Vanlauwe et al., 2011.

Development domains comprise the main drivers for intensification

Overall environmental conditions and varying socio-economic circumstances are expected to influence the options and pathways available to smallholder farmers to intensify their farming systems. Important drivers towards intensification include high population densities, good access to markets, and appropriate agro-ecological conditions. Within the Africa RISING sites, it is important to understand the current status of each of those drivers and construct development domains that encompass areas with similar conditions in order to ensure that scaling up processes and approaches are integrating this crucial information. Substantial experience exists with identifying such domains (Chamberlain *et al.*, 2006) and Africa RISING will take this logic a few steps further by identifying entry points towards intensification in line with the overall domain conditions and integrate these into dissemination approaches.

Farm household typologies and intensification pathways

Within rural communities, access to farming resources for households is variable and determines, to a great extent, the options that these households have to intensify production and take risk. Innovative efforts to improve productivity of smallholder agricultural systems must be designed to target socially diverse and spatially heterogeneous farm systems. Household typologies can be constructed around the resource status and production objectives of farming households to simplify the diversity of households and their farming systems. Typologies on farming systems, farms / households and fields can be further help in targeting specific households in rural communities. We can hypothesize that the diversity of livelihood strategies can be described as alternative system states which dynamics exhibit non-linearity, irreversibility, hysteresis, and transformability (Figure 3).

We consider, therefore, farming systems in the light of five possible broad rural household livelihoods strategies from poverty and hunger: (i) intensification of production; (ii) diversification of agricultural productivities for increased output value; (iii) increased farm size; (iv) expansion in off-farm income; (v) and complete step out of agriculture. By considering the household diversity as alternate system states, we can identify pathways out of poverty. Targeting specific households having a specific set of resources and livelihood objectives will be a crucial strategy of Africa RISING and forms one of the cornerstones of the research hypotheses that we have formulated.

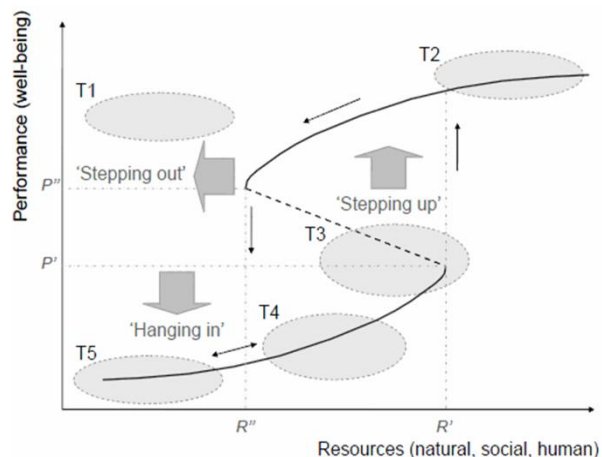


Figure 3: Theoretical representation of the position of five household types (T1-T5) that are common in East Africa in a two-dimensional plain defined by resource endowment and performance (in this case, 'well-being'). Source: Tiftonell et al., 2005.

R4D platforms for cooperation and co-learning

Since system interventions require the engagement of various research and development partners, operating in the context of specific components within these systems, proper means for meaningful and effective interactions are needed to prioritize, guide, and evaluate the various research and development processes within Africa RISING. In line with the logic of the CGIAR Research Program on the Humid Tropics, R4D platforms will be constituted within specific development domains.

Sustainable Intensification is thereby assumed to be feasible only when farmers are connected to profitable and efficient value chains. The platforms will design, implement, evaluate project activities and disseminate and communicate research findings. In this context, R4D platforms will operate where the supply of improved technologies meets the demand from farming communities to address important constraints to sustainable intensification. R4D platforms are different from innovations platforms in the sense that the former are dynamic and responsive to changes in economic conditions and to emerging production problems (e.g., pests and diseases). Innovation platforms draw rather upon technologies 'on-the-shelf' and have less of a research orientation.

Identification and nature of critical entry points towards intensification

Africa RISING is about sustainable intensification of cereal-based crop-livestock systems. Demand-driven³ entry points towards achieving this goal will result from the situation analysis, the *ex-ante* potential of certain interventions and technologies, and agreement between the partners constituting the R4D platforms. Such entry points could consist of technologies or technology components aiming at productivity enhancement (e.g., improved varieties, ISFM practices, water harvesting, livestock feed production), natural resource management (e.g., erosion control, agroforestry), income generation (e.g., value addition, collective marketing) or knowledge management (peer-to-peer knowledge exchange, decision tools for adaptive management); and most likely a combination of all the above. They can also include innovations related to social and institutional arrangements, eventually in combination with specific technology components. Africa RISING will not aim at promoting ‘panacea’ technologies or technologies that are best under all farming conditions.

Integration of ethical principles in science for development activities

Since many activities involve the direct engagement of farming families and related collection of private information, existing guidelines on good practice while working with farming families will be adopted for all Africa RISING activities. Engagement standards in participatory research are online at:

cgspace.cgiar.org/handle/10568/34830

³ ‘Demand-driven entry points’ refers to entry points that respond to problems identified and/or requests made by the target farming populations. Note that the scope of a specific problem or request (e.g., low soil fertility) is often broader than the specific SI components (e.g., the use of fertilizer) and that specific SI components include technologies and innovations that are new to a specific farming community.

6. Conceptual Framework

Africa RISING intervenes at the household level but acknowledges that households interact with and influence various dimensions beyond the household scale at the community, landscape, and regional level (Figure 4). Across the different countries, development domains will be constructed around existing ranges of three main drivers affecting intensification, i.e., population density, market access, and agro-ecological potential].

Within these domains, different farming systems will be identified in relation to human population and livestock densities in addition to good agro-ecological and market potential for SI. These include: crop-based (e.g., maize sole, sorghum sole, wheat sole, etc.) systems; crop-livestock intensive (zero grazing) systems; crop-livestock extensive (free grazing) systems; and livestock-based systems. Within these systems, farm typologies will be developed, and entry points towards sustainable intensification will be identified, based on the overall characteristics of a specific development domain and farming systems as well as the resources available to a specific household. These entry points will be identified and evaluated, using the research logic detailed in Figure 4, thereby acknowledging the guiding research principles underlying Africa RISING.

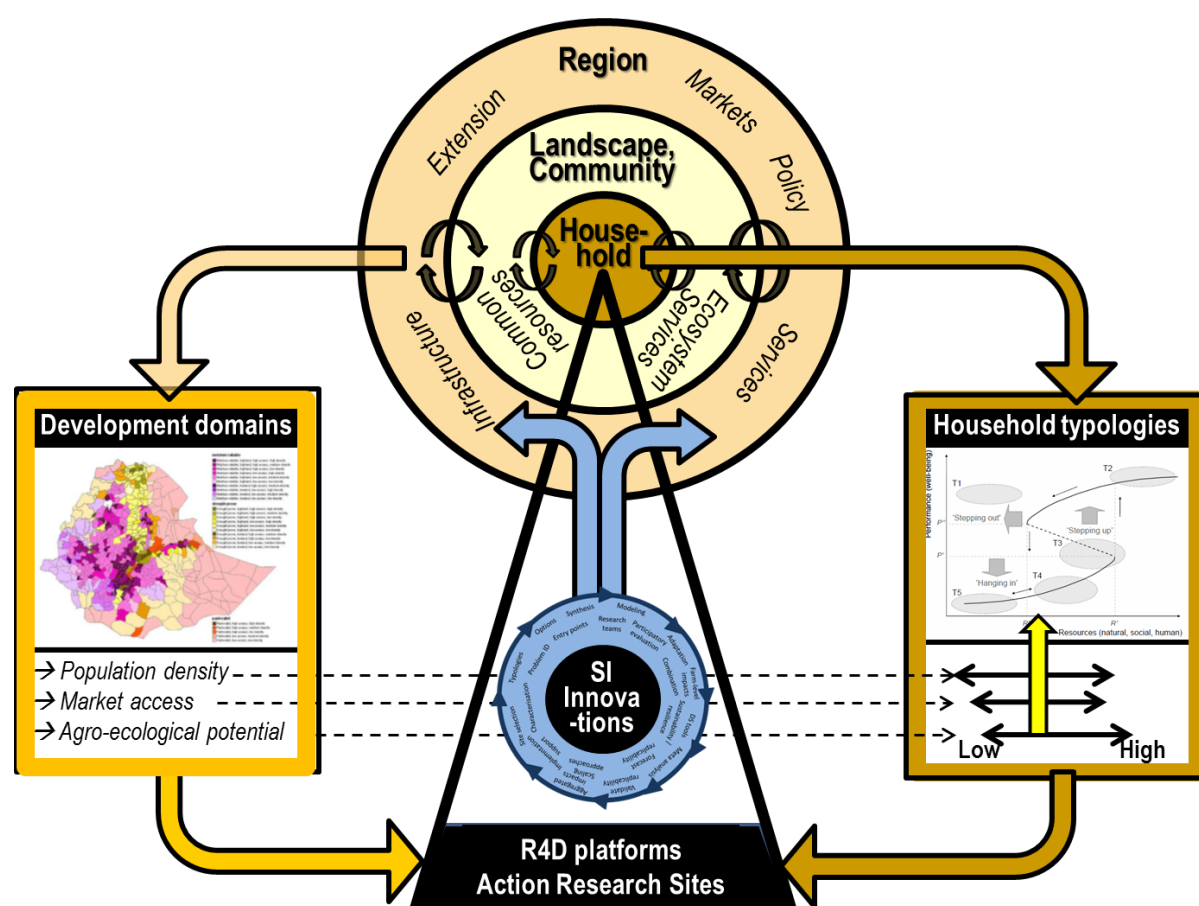


Figure 4: Conceptual framework of Africa RISING, highlighting the place of households in the overall rural landscape and the impact of large-scale (orange arrows) and household-level (brown arrows) drivers on the identification of specific sustainable intensification (SI) innovations through R4D platforms operating at Action Research Sites which are representative of the target regions and the farming communities therein. The blue central circle refers to the overall research approach (Figure 5) and the blue arrows moving up indicate the scaling activities beyond the Action Research Sites to the different target regions.

7. Research Hypotheses

The research in Africa RISING is designed to test 5 program-wide hypotheses. We anticipate that Africa RISING projects will formulate their own research hypotheses at the next level of detail but that each of these will demonstrably contribute to the testing of at least one program hypothesis.

Integration hypothesis

Integrating technological components into SI systems confers more benefits to smallholder farmers than single components.

Innovations with components that mutually reinforce whole farm performance/productivity produce greater and more sustained benefits than the joint adoption of equally effective single purpose technologies and practices.

Adoption hypothesis

Integrating technological components into SI systems stimulates more adoption compared to single components.

Trade-off hypothesis

Targeting better tailored interventions that suit the context specific environments and the diverse local conditions in smallholder farms/households will lower environmental damage.

Effective targeting of innovations reduces the negative impacts of trade-offs between farm productivity and environmental sustainability and helps to identify potential “win-win” options for SI.

Innovation sequencing and sustainable intensification pathways hypothesis

The adoption of innovations that lead to SI is affected by the sequence in which the component technologies, practices, and knowledge are integrated and applied, whereby any step resulting in reduced farm-level outcomes will reduce the ultimate uptake of these innovations.

Scalability hypothesis

Agricultural SI interventions that are tailored to diverse local conditions on smallholder farms are more likely to be scalable to similar populations and environmental settings.

A research approach based on targeting and evaluating SI-related innovations, increases the relevance of findings from action research sites and enhances their scalability to similar strata elsewhere (i.e. to similar development domains and households typologies in other locations).

8. Research Outputs and Activities

To address above program-wide hypotheses, the research component of Africa RISING is organized around 4 research outputs that are logically linked in time and space (Figure 5). These research outputs are at the core of the research framework and define the key elements of the Africa RISING program as implemented by each of the three component projects. Details on activities under each output are given in Section 8.

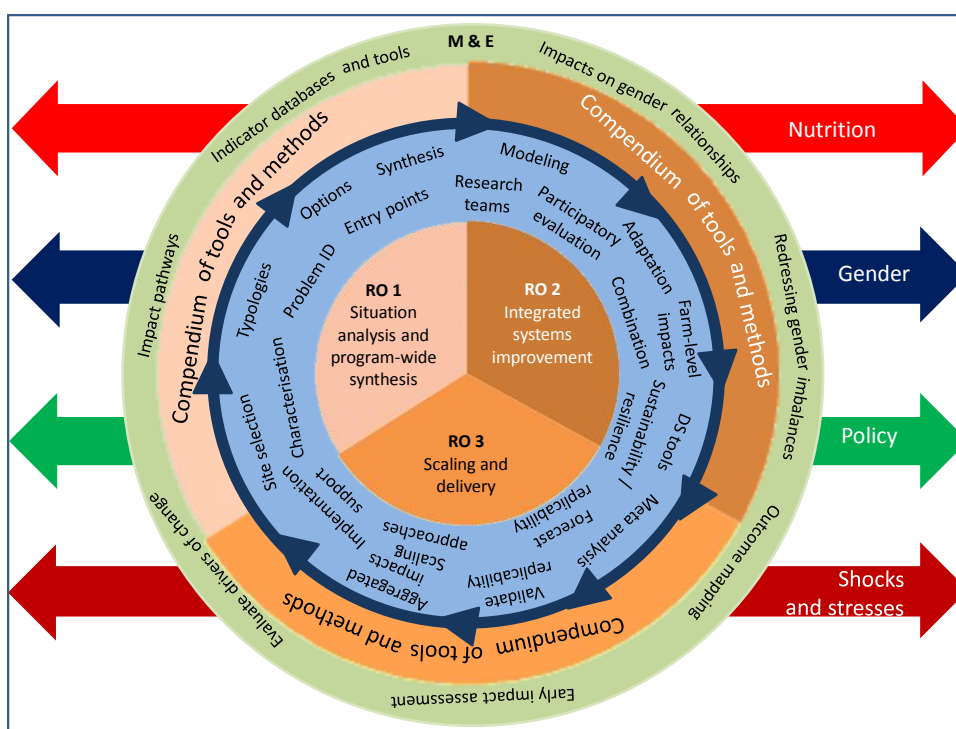


Figure 5: Schematic representation of the program's Research Framework, indicating the 3 Research Outputs (RO), the various tools that could be used to address the outputs, and the components of the M&E framework. Also indicated are some cross-cutting themes that apply across all ROs (arrows).

Research output 1: Situation Analysis and Program-wide Synthesis. Activities under this output aim (i) at ensuring that best-bet or best-fit interventions are aligned to priority constraints – within development domains – to improved livelihoods and to the prevailing livelihood and production environment conditions and (ii) at developing a program-wide synthesis related to the lessons learnt across the various target areas.

Research output 2: Integrated Systems Improvement. Activities under this output will test, validate, and adapt specific interventions aiming at farming system improvements in terms of productivity, income, and natural resource status.

Research output 3: Scaling and Delivery of Integrated Innovation. While the first two outputs will generate integrated technology combinations that are effectively targeted to farmer's real development needs, the scaling and delivery output will develop appropriate approaches for scaling out innovations, taking into account the often complex nature of system interventions.

Research output 4: Integrated M&E Process. A participatory monitoring and evaluation framework will ensure that the outcomes related to the various outputs are clearly understood, that lessons learnt from one output are fed back into other outputs, and that the linkages between the various outputs are operationalized.

Each research output will be delivered by a set of activities designed to deliver against the program's purpose and objectives. However, the research framework is not prescriptive about how each activity is actually carried out. The aim is to develop a compendium of methods that might be used to deliver on each activity within framework. The research activities are described in detail below against the defined research outputs. They are also indicated in the blue circle of Figure 5 and represent the continuous process by which the project will identify adapt and deliver integrated options for SI to farm households.

Research output 1 (situation analysis and program-wide synthesis) activities

Construction of development domains within and across the project mega-sites

Development domains will be determined by the intersection of three attributes (agro-ecological potential, market access, and population density). Mega-site areas will be classified according to their dominant agricultural development conditioning factors. The specific metrics of each those attributes and the thresholds distinguishing them (e.g., high/low states), will be determined with each mega-site team. IFPRI will additionally maintain a SSA-wide representation of development domains as part of their commissioned M& E activities. These domains, according to the program's research hypotheses, are considered to be representative of significant different development conditions, potential intervention options, and likely levels of adoption and impact. These domains will be characterized based on cropland area, dominant cereal area, cattle population, number of poor people, and dominant farming systems, amongst others to guide action site selection. Meta-analysis of secondary information on production, demographics, market access, and agricultural potential was used to classify different domains in mega-site areas. GIS tools are used to map out the domains.

Selection of action research sites within the development domains of each mega-site

This activity will identify operational units within each priority domain through which Africa RISING will engage with farming households and partners towards achieving its research and development goals. Action research sites will be linked to impact pathways through R4D platforms and will be representatives of the development domain characteristics. Sufficient sites should be chosen to include 'control' sites that could provide statistically robust estimates of the potential impacts of some of the higher profile AR intervention options. Both action and control sites will be randomly chosen in domains with similar characteristics following a Randomized Controlled Trials (RCTs) design whenever it applies. GIS tools will be used to identify potential sites. Field visit will be undertaken by research implementing team to ground-truth proposed sites and to confirm their initial conditions. The site selection can only be finalized after the integration of priority sites of partners and confirmation of the interest of farming communities to engage in Africa RISING.

Establishment of R4D platforms

Action research sites will be linked to target value chains through R4D platforms which will be constituted at district/woreda level because agricultural research, extension and development activities are coordinated by district agricultural extension officers at the lowest jurisdictional units. Also agricultural and rural development interventions are clustered at the district level among government administration units, police, courts, public research and extension organizations, farmers, farmers' organizations, NGOs agricultural input suppliers and output marketing firms, credit and finance organizations, and other service providers.

In certain countries, partnership platforms or similar structures have been set up through governments and are facilitated by District Officers. In such cases Africa RISING will operate through such existing structures and strengthen their functioning where appropriate.

Activities of R4D platforms will consist of: (1) Identification of priority value chains around which Africa RISING activities will be developed, including the identification of essential partners along these chains; (2) Confirmation/verification of the appropriateness of 'best bet' options and potential interventions towards system intensification using the components of above value chains as entry points; (3) Identification of training and capacity building needs of partners to support research and uptake of findings; (4) Monitoring and evaluation of progress with project implementation and, where and when necessary, agreement on re-direction of project activities; (5) Dissemination of knowledge generated by the research; (6) Definition of emerging research issues and questions to be tackled by the research teams within the R4D platforms; (7) Co-learning and exchanging of research and development experiences towards enhanced efficiency and efficacy of the platforms in delivering outcomes and impact; and (8) Engagement with national and local policy to facilitate an enabling environment for engaging smallholder farmers in the priority value chains. Participation in R4D platforms will be based on the following principles: (i) specific expertise related to one or several components of the priority value chains, (ii) contributions in cash and/or kind towards the functioning of the platforms, (iii) provide leaderships related to specific activities facilitated by the platforms, and (iv) representation of vulnerable and marginalized groups.

Potential tools to be used: (i) District/woreda-level participatory needs assessment meetings with stakeholders; (ii) Visioning the outcomes of the R4D platforms; (iii) Focused discussions on terms of reference, roles and responsibilities, agendas, contributions, and decision-making processes.

Baseline data collection

Baseline information related to the major impact indicators and targets of Africa RISING is required to (i) determine baseline conditions of the action research and control sites, (ii) confirm their similarity or identify their dissimilarity, (iii) collect the required information for defining farm household typologies, (iv) understand the major constraints to improved livelihoods, and (v) identify opportunities for targeting SI options.

Potential tools to be used: Baseline surveys implemented following a stratified (interventions, farm households and communities, action and control sites, farming systems, development domains) sampling framework.

Construction of farm household typologies

Africa RISING operates at farm household level. AR principles include an appreciation of the diversity and spatial heterogeneity that characterize smallholder farming systems at project sites. Farm household typologies will be developed to simplify the diversity in smallholder farm households. Construction of typologies will further improve the understanding of the complexity in smallholder farms by identifying drivers of household diversity. The drivers allow formulation of farm household typologies that can be used to categorize smallholder farm households and establish recommendation domains for better targeting of SI

interventions. This activity will allow the projects to targeting farmers with similar characteristics that are likely to choose similar technologies from available options, determining the likelihood of adoption of particular combinations of innovations.

The methodology of the typology formulation is articulated around the first step of the DEED approach by Tiftonell (2007). This approach helps to define representative prototypes of fields, cropping sequences, farms or localities that capture key management, socio-economic, and agro-ecological aspects of systems under study. Their heterogeneity and diversity at different scales will be categorized, relying on solid understanding of key drivers of such variability and using methodologies that allow comparisons across systems. Participatory wealth ranking through focused group discussion will be used to identify different wealth classes of farm households. A combined data driven (PCA and clustering) and expert-knowledge method will be used to refine the wealth ranking and to categorize households into functional farm types. In order to allow comparison and harmonization across sites (within project), the typologies will be developed based on simple criteria that include land size, livestock ownership, hiring labour, hiring out labour, number of food security, production strategies and orientation. Data on these proxies will be derived from baseline surveys. Household typologies will be developed to suit the purpose of each project in the mega-site.

Potential tools to be used: (i) Participatory wealth ranking through focused group discussions; (ii) Clustering household level information obtained through the baseline study.

Inventories of innovations

Potential innovations, in line with the identified development domains and farm typologies will be identified and categorized as on-the-shelf, indigenous knowledge, or currently being promoted. These will form the basis for prioritizing system-level (combinations of) innovations that Africa RISING will initially focus on. Through the M&E cycle, the nature and composition of these innovations will be adapted as relevant.

Potential tools to be used: (i) Early win projects; (ii) Secondary literature information, (iii) Expert knowledge, (iv) Specific questions on indigenous knowledge to be integrated in the baseline survey.

Identification and prioritization of innovations addressing major constraints

Based on the composed 'basket of options and innovations', prioritization based on focused group discussions and participatory modeling through the R4D platforms, will identify those options with the greatest potential for improving farm level productivity, income, and natural resource status, adapted to existing farm typologies.

Potential tools to be used: (i) Literature studies; (ii) Early-win project reports, (iii) Focus group discussion through the R4D platforms; (iv) Farming system analysis and simulation modeling, (v) Baseline information, including market value chain analysis.

Program-wide synthesis and co-learning

Africa RISING will integrate learning across the various target areas towards the production of International Public Goods. Meta-databases and learning tools will be developed and populated through activities in the different mega-sites. Annual program-wide planning meetings will include cross-site learning, culminating in a final synthesis workshop.

Potential tools to be used: (i) Meta-databases and econometric modeling; (ii) Standard M&E and learning tools; (iii) Annual general planning meetings; (iv) Synthesis workshop.

Research output 2 (integrated systems improvement) activities

Identification of research teams within the R4D platforms

Within the R4D platforms and constituted around critical entry points, research teams will be identified to lead innovation activities related to system improvement. Although all platform members will be engaged at one stage in research activities, this team will provide overall leadership in terms of evaluating and validating the agronomic, economic, and environmental performance of entry points, generate M&E data, adapt and use models, translate information in knowledge accessible to all platform members, amongst others.

Potential tools to be used: (i) Discussions through the R4D platforms; (ii) Sub-agreements with research partners.

Identification of modeling and decision support tools for the ex-ante technology identification, trade-off analysis, evaluation of the ex-ante sustainability and resilience of options, and guiding future research

Several decisions, related to the identification of critical entry points, anticipating their potential benefits, and evaluating trade-offs will require farm-level modeling tools. Specific indicators that point towards enhanced sustainability and resilience, e.g., to climate change, will be monitored for the various evaluation and validation activities. Specific long-term monitoring sites will be established to gather the necessary information on the dynamics of these indicators as related to the options evaluated. To fast-track the identification of best options in the context of existing development domains and household typologies, decision support tools will be developed. These are expected to be a combination of formal modeling tools, compendia of validated best practices, 'rules-of-thumb', amongst other.

Potential tools to be used: (i) AfricaNUANCES modeling framework; (ii) Formal and qualitative trade-off analysis models; (iii) Focus group discussions through the R4D platforms.

Participatory evaluation and adaptation of appropriate combinations of technologies and interventions

Multi-location adaptive research campaigns will be organized to evaluate and adapt promising innovations/technologies and interventions for different farm typologies and eventually combine several of these towards enhanced SI. Combining several components for intensification has the potential to create positive interactions between these. Experimental designs and methods (to be documented) will ensure that such interactions can be quantified and evaluated.

Potential tools to be used: (i) On-farm multi-location research campaigns; (ii) Demonstration trials; (iii) Adaptation (baby trails); (iv) Monitoring of farmer practices; (v) Detailed M&E tools.

Facilitation of farming communities to engage with profitable markets

Improved productivity and soil health can only be sustained if farming communities continue to invest in farming, hence the need for sufficient income and access to profitable produce markets. Improved storage, timing of sales, and value addition are all concepts that have proven their worth in the target areas. Most important is to identify those steps in the value chains where farming communities could significantly increase their income, thereby ensuring that all players in that value chain make reasonable margins.

Potential tools to be used: (i) Value addition options, including post-harvest processing and packaging, (ii) Value chain analysis, (iii) Collective action, including marketing.

Assessment of new research challenges and opportunities emerging from the activities

It is anticipated that new research issues will be identified through the M&E framework while testing anticipated best options at scale. Such research challenges, when relevant, will be addressed through specific interventions, eventually including greenhouse and on-station activities.

Potential tools to be used: (i) Detailed M&E tools; (ii) Multivariate and other statistical tools, (iii) Specific research protocols for greenhouse or on-station implementation.

Research output 3 (scaling and delivery) activities

GIS mapping techniques will be used to select research sites in order to ensure that they have development domains that are representative of other parts of the regions and that results can be extrapolated to other areas. The development domains will be based on a combination of agricultural potential, population densities and market access. GIS will also be used to select matching districts and villages that can be paired to the intervention treatment districts using observable characteristics and that will serve as controls in order to construct counterfactual outcomes. The sites will be selected to cover a wide range of different geographical areas. Econometric modeling will be used to assess the replicability of the results and scalability to other settings.

Assess scalability of integrated innovations (meta-analysis of options)

A specific set of targeted innovations identified as promising will be assessed for scalability using a range of methods, for example, meta-analysis, GIS, modeling or literature survey with development agencies.

Identify and develop (where necessary) scaling approaches for targeted integrated innovations that are identified to have potential for scalability

GIS and spatial econometric modeling and hierarchical meta-modeling approaches will be applied to analyze data the impact of integrated SI innovations at different sites outside the testing environment. Meta-modeling approaches will be used to predict the replicability of the SI innovations in other sites and extrapolate results outside the current geographically targeted areas. Crop growth simulation models such as DSSAT and APSIM will be calibrated and applied to develop site specific extension messages that could be out-scaled to small-holder farmers. Extension messages are often developed for large regions, not taking into account the variability in soils, microclimates, and socio-economic conditions within those regions. The development and fine-tuning of decision support tools (DST) for small-holder agriculture can help with the diagnosis and analysis of problems and opportunities in food production systems and lead to increased productivity. Such tools will be particularly flexible and powerful when integrated with Geographic Information System (GIS) tools. The DST can be used at various stages of decision-making including site selection, evaluation of various management options, and extrapolation and scaling-out of results obtained in limited area to other areas.

Pilot and test scaling approaches from action sites within project area

Alternative approaches for scaling up and scaling out SI innovations will be pilot tested. These will vary from market to institutional-based approaches. Market-based approaches will be tested in situations where the technology is embodied in inputs; access is through agro-dealers; farmers have purchasing power; and yield is dependent on farmer management. Institutional-based approaches will be tested in situations where the technology is embodied in improved management; technologies are information and labor intensive; multiple constraints exist; and there is a productive base for introduction of inputs. Systematic monitoring and evaluation and quasi-experimental methods will be used to assess what approaches work, where, for whom and for how much.

Develop costed templates for scaling by development investors

In partnership with development agencies develop a costed program of work for scaling across a target area.

Evaluate aggregated impact of household level interventions at landscape scale and beyond

The aim of this activity is to assess the impact of sustainable intensified farming systems at landscape level starting from the farm household that is the functional domain for Africa RISING's activities. From both economic and environmental perspectives, choices of interventions depend on physical conditions, resources available, policies, markets and costs of production, and expected prices for outputs.

Due to the complexity and heterogeneity of agricultural landscapes along with the variety of scale at which the impacts are perceptible, the methodology should be able to capture and scale up the aggregated impact including (i) productivity enhancement (adoption of innovations); (ii) maintenance of ecosystem services (soil organic carbon storage, biodiversity conservation, erosion control, regulation of water flow, etc.); (iii) income generation and stability.

The Land Degradation Surveillance Framework (LDSF), a standard method designed for sampling a wide range of landscapes to provide baseline of land resources (e.g. soil and vegetation) will be used to assess ecological variables at different levels. The framework is a nested sampling design developed to collect data at different hierarchical spatial scales ranging from plot to landscape. This data collection framework enables not only cross-comparison of processes within and between sites but also enables predict processes at other locations and levels using available covariates and multi-level modeling approaches. Integrating the LDSF and socio-economic data, the aggregated impacts of interventions under specific biophysical, socio-economic and household typologies can be predicted at landscape scale using scenario analysis or modeling approaches such as agent-based modeling (ABM).

Evaluate/validate scaling approaches for integrated systems

GIS mapping techniques will be used to select research sites in order to ensure that they have development domains that are representative of other parts of the regions and that results can be extrapolated to other areas. The development domains will be based on a combination of agricultural potential, population densities and market access. GIS will also be used to select matching districts and villages that can be paired to the intervention treatment districts using observable characteristics and that will serve as controls in order to construct counterfactual outcomes. The sites will be selected to cover a wide range of different geographical areas. Econometric modeling will be used to assess replicability of the results and scalability to other settings.

Potential tools to be used: GIS mapping techniques, spatial econometric modeling

Research output 4 (monitoring and evaluation) activities

By definition, the M&E activities of Africa RISING are not part of the research program, but constitute a complementary capacity to deliver robust and consistent tracking of Africa RISING implementation activities as well as evaluation of the ultimate impact of those research investments. Nevertheless, there are some novel aspects of the M&E approaches and outputs that merit specific attention in the context of the research agenda.

Validation of indicators and impact pathways

There are two primary categories of performance indicators; a set of program-wide, consistent outcome and impact indicators that capture and communicate the overall success of the Africa RISING initiative, and a set of more tailored indicators that reflect progress in specific production system, market, and socio-economic contexts. While program-wide outcome and impact indicators will be prescribed by the M&E team to

conform to Feed the Future reporting requirements, local, context-specific (“custom”) indicators will be established through more participatory approaches within each project for the purpose of monitoring productivity, profitability, nutrition, ecosystem service flows, and gender-related outcomes. Stakeholder participatory processes will also be key to validate the theory of change assumptions implicit in this research framework that link Africa RISING activities and outputs to outcomes and impacts.

Potential tools to be used: These activities will involve multi-stakeholder engagement during the early phase of the project in indicator and pathway articulation and validation followed by a mix of administered surveys gathering information on prescribed indicators as well as participatory monitoring and evaluation operationalized through agreed annual work plans and assigned responsibilities and resources.

Development of an M&E indicator collection, management, and sharing platform

This activity will develop program-wide data collection instruments and database for assessing indicators in time. Online geo-referenced electronic data bases will be developed to capture, store and track the progress of research components using the M & E indicators. The data base will be used to monitor overall progress and for the mid-term and final evaluation of the project.

Potential tools to be used: The approach will involve development of a single, consistent web-based geo-referenced M&E data platform, using web content management, database management, and specialized geo-processing and data visualization tools.

Assessment of the nutrition and gender-specific outcomes of SI interventions

While the core set of performance indicators of Africa RISING will focus on those measuring progress to delivering sustainable enhancements in farm-scale productivity and improved family income, there are other important AR concerns and objectives. These include ensuring that the pursuit of sustainable intensification also contributes to complementary goals of enhanced family nutrition and other positive outcomes that benefit, in particular, women and children family members. The process of identifying and tracking appropriate performance indicators will therefore pay particular attention to ensuring metrics are identified to allow progress on the nutrition and well-being of women and children to be monitored with confidence. The results of these efforts are seen to be helpful, for example, in identifying gender-differentiated technology needs, choices, constraints, and test mechanisms that will serve to enhance technology targeting, delivery, and equitable access for greater impact on both men and women.

Ex-ante assessment of project- and program-scale outcomes, impacts and spillover potentials

The capacity to undertake ex ante assessments of the potential impacts of AR innovations on productivity, nutrition, environmental services and household welfare satisfies two important needs. First, it can inform tactical AR research management decisions on fine-tuning the type and mix of innovation options (whether on-going or planned) in specific action research sites in order to achieve better outcomes at those sites. Second, it can be used to assess the likely magnitude and distribution of potential impacts across representative farm types and at the market level if those innovations were to be adopted much more broadly than at the action research sites (e.g. by farmers in similar agro-ecological and development contexts elsewhere in the country, or even across multiple countries). Such strategic, scaling out assessments are of value in helping communicate, justify and target investments at a programmatic and cross-project level, and help identify significant opportunities for additional investments in the scaling out (spillover) of SI innovations across broader groups of potential beneficiaries. These analyses, furthermore, help anticipate feedback effects of productivity-raising innovation success on market prices and highlight the benefits of improved value chain efficiency.

Discussions are underway to ensure that both the tactical and strategic opportunities for ex ante analyses of potential AR outcomes and impacts are conceived and implemented in concert. This will likely include joint formulation of work plans and sharing of data and method expertise. The broad aim of this activity is to use

ex ante approaches to assess the potential impacts of the AR program, given likely targeted interventions, and the typologies of farm households, farming systems, and domains within each project.

This quantitative impact assessment approach will necessarily involve simulations based on a mix of empirical data and assumptions, including where possible baseline measurement of the key input-output relationships that will be affected by the adoption of SI innovations. Specific attention will be given to identifying input-output relationships for: (i) main crops in the farming systems, including cereals, legumes, and vegetables; (ii) feed-livestock productivity; (iii) fertilizer (organic and inorganic) – soil fertility; (iv) labor productivity by gender; (v) revenues, costs, and profits of SI interventions, as well as to assessing trade-offs amongst productivity-enhancing and resource-enhancing impacts at the whole-farm scale. The interactions among farming system sub-components, such as; crops, livestock, trees, soil nutrient management, trees, marketing, and on-farm and off-farm employment will need to be articulated for each representative household/farming system type.

Analyses will be based on a mix of secondary data from field experiments, regional GIS, and household data as well as assumptions about adoption in order to predict potential impacts on productivity and on markets across entire regions or countries. Secondary data will be blended with actual site measurements. Based on the importance of certain relationships for target farming systems, ground-truthing requires specific field experiments.

Potential tools to be used: The ex ante evaluation will rely heavily of the use of “whole-farm” simulation models that assess the interactions between climatic conditions, soil types, nutrient dynamics and technology and management choices in cereal-based farming systems (including livestock enterprises) in Africa.

Potential analytical tools are: the NUANCES (Nutrient Use in Animal and Cropping Systems: Efficiencies and Scales – Giller et al., 2006) and the APSFARM (Agricultural Production System: whole-farm business simulator – e.g., de Voil et al., 2009) frameworks.

Adoption and impact studies

As one approach to evaluating Africa RISING investments, targeted studies will be undertaken to examine factors most influencing farmers’ decisions to adopt sustainable intensification innovations. These studies will draw on a range of data sources to assess a broad spectrum of potential adoption and impact determinants, including farm and household characteristics, landscape attributes, and regional and national factors.

Potential tools to be used: Econometric approaches will be used to evaluate adoption and impact determinants. For example, adoption plot level crop yield y_{it} can be modeled as

$$y_i = f(\text{House}(\text{gender}, \text{age}, \text{assets}), \text{Com}(\text{resources}, \text{services}) \text{Re gion}(\text{exten}, \text{market}, \text{inf rastructure}))$$

9. Monitoring and Evaluation

The HarvestChoice team at IFPRI has been charged with the monitoring and evaluation activities of Africa RISING.

As many operational activities of Africa RISING are still being finalized, the initial M&E plan is subject to further revision and refinement. This plan describes the program's M&E approach and strategy, the currently understood and agreed intended outcomes and measurable indicators for tracking progress toward and achievement of those outcomes, the M&E methods to be used, and the initial assignment of M&E responsibilities.

Beyond the need to satisfying standard/conventional M&E requirement, this plan also describes activities designed under an expanded Africa RISING M&E scope. These include: (i) a structured stratification schema (by geography and household categories) and action research and control site selection process, (ii) a program-wide, spatially-enabled M&E data management and sharing platform open to program participants and stakeholders, and (iii) initial steps in embedding a farming-system modeling capacity into the program's M&E toolkit.

The role of modeling is to better integrate and interpret monitoring data in ways that will enhance research design, evaluation and learning as well as, looking forward, research investment targeting and scaling of proven technologies and practices.

While they are highly complementary, monitoring and evaluation are separate both in their purpose and their implementation. Bearing this in mind, the current M&E plan does not describe a single combined activity, but describes each of them separately.

M&E goals and objectives

Monitoring and evaluation of project activities support effective project management, provide the data for timely reporting to project funders, and help all stakeholders learn about the project's successes and failures. A robust M&E system should provide learning on what did and what did not work that, in turn, should inform the design and implementation of new interventions, as well as catalyze adjustments to ongoing activities that might enhance efficiency and effectiveness.

Critical aid in effective management

Monitoring can be a critical aid in effective management when it provides project managers with timely information on the status of activities and the results they are achieving. This allows managers to assess the need for changes in strategy or implementation.

Reporting requirements

Auditing and monitoring staff require frequent reporting of progress and results (monitoring) from project implementers, in order to provide funders with the evidence they need to both justify the expenditures underway and to maintain a flow of resources. In this regard it is vital to have clarity and consensus on the scope and nature of the expected direct results and beneficiaries, as well as on associated indirect outcomes, be they positive or negative. For example, direct results might include increases in productivity, incomes or nutrition in target smallholder households, whereas increased demand on women's time or reduction in catchment water yields might be key indirect consequences that need increased monitoring and, possibly, ameliorative action. The selection and/or development of appropriate indicators, as well as the determination of their associated reporting needs (e.g., metrics, frequency, and disaggregation) need to account for all direct and indirect outcomes important to both clients and stakeholders.

The Africa RISING M&E strategy to best meet these needs is of relevance both to USAID and to implementation partners since the data required to satisfy donor needs are also of value to CGIAR and national research scientists and institutions as part of their own internal M&E needs. This plan, therefore, strives to meet the legitimately distinct goals and priorities of both USAID and the CGIAR M&E systems.

Learning

Development projects provide great opportunities to learn what works and what does not. This can be done through rigorous independent impact assessment and/or through evaluation(s) carried out by project staff. Given that the impact of large and highly visible projects will be reported at high levels, USAID's evaluation policy specifies an independent (and rigorous) evaluation. However, USAID recognizes that much valuable learning can also be achieved through evaluations carried out by the project itself. Africa RISING is likely to collect or make use of large amounts of detailed information, which can support various types of evaluation, especially if the evaluation design is carefully considered at the outset of the project. The key questions that Africa RISING (both at a program and project levels) has set to answer will inform the design of the consequent evaluations, with the latter being probably among the most important challenges that the program faces.

M&E in the Context of Africa RISING

Apart from the usual research outputs and impacts, the Africa RISING program has also set itself the goal of developing best practice approaches to the design and implementation of sustainable intensification investment programs. This ambition also extends to the M&E workstream and a deliberate attempt has been made from the project outset to maintain and document a structured and systematic approach to all aspects of M&E including dimensions such as research site stratification and selection, a systematic, open access M&E data management platform, and novel analytical tools to complement traditional econometric evaluation approaches.

While the specific elements of the M&E system need review and acceptance from all implementation partners involved (and to this end the annual M&E meeting described below is crucial), there are at least four data and analytical components of the M&E evaluation system:

- **Delineation and characterization of target farming systems:** This activity relies on the fusion of regional, spatially-explicit data, agricultural production data, environmental data, and farm/household data for representative participating and non-participating households;
- **Technology/intervention inventory:** An inventory of the individual and integrated farming system interventions/innovations (together with their distinctive characteristics) whose adoption and impacts need to be evaluated;
- **Change estimation/projection models for selected indicators:** e.g., productivity change, land, labor (gender differentiated) and water use efficiency; and
- **Attribution assessment:** In addition to the ability to measure and model change in indicators is the need (with additional information/assumptions) to assess the extent to which Africa RISING contributions contributed to those changes.

Initial M&E activities were aimed at seeking synergies with national and international partners in tapping available and reliable data sources. Subsequently, according to the quantity, quality and relevance of information available for each of the three mega-sites, targeted data collection will be required at the local level, through qualitative and quantitative *ad-hoc* surveys. These data will complement the suite of accessible HarvestChoice spatially-disaggregated indicators. The M&E main components, activities and outputs are schematically represented in figure 6 below.

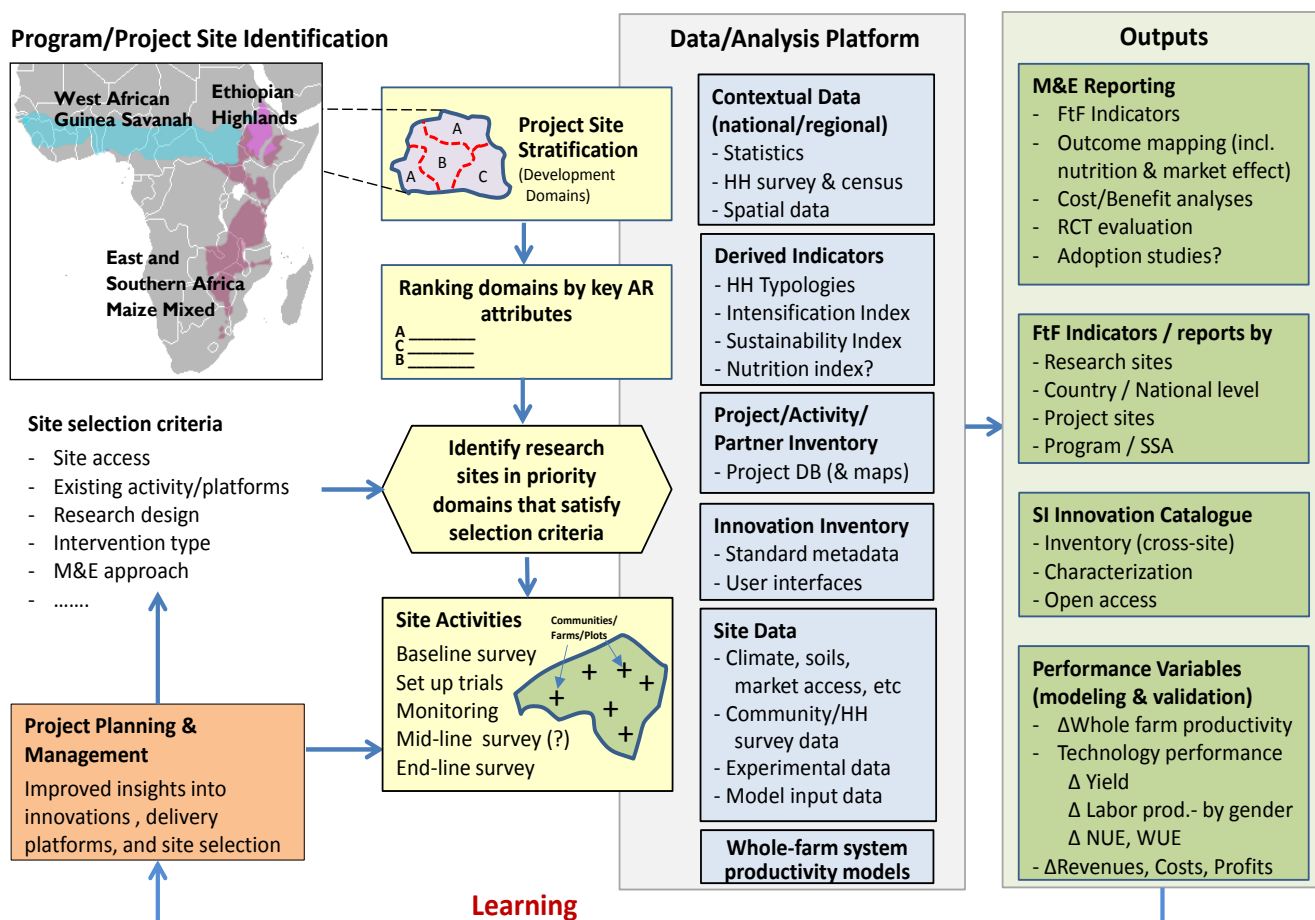


Figure 6 Africa Rising M&E Components, Activities, and Outputs

With respect to monitoring, IFPRI's HarvestChoice team is partnering with each lead CGIAR center in observing and reporting FTF indicators and setting their targets for each of the mega-sites. Annual M&E documents will include data integration and modeling using more comprehensive and local data sources, some of which will rely on data sharing protocols being established with other implementation partners. An inferential analysis based on the characteristics of each farming system/household typology will also be undertaken to target "homogeneous" groups of farmers for determining the likelihood of adoption of specific interventions.

A mix of M&E approaches

The M&E activities of Africa RISING rely heavily on data collection and analysis, both for reporting and for management. Initially, baselines or situation analyses are being conducted (also as an M&E team contribution to Research Output 1) in order to generate data for agro-ecological characterization, farming system analyses, household characterization by typologies, diagnosis of production system constraints and opportunities, generation of an innovation inventory, and for benchmarking innovation performance.

Agro-ecological, demographic, land use and marketing system characteristics can be combined, for example, to generate "development domains" that stratify geographic areas having similar sets of development issues and that provide opportunities for different sets of interventions. Analysis of baseline household information on resource endowments (e.g., land, labor, livestock, and finance), livelihood strategies, production orientation and household aspirations will also be used to develop household typologies that simplify the

diversity in farm households. Regional geographic stratification and household typologies can be used to better target interventions and help identify representative or otherwise appropriate action research and control sites.

Participatory approaches will be used to identify technology options and combinations that best suit specific farming systems and household categories, and those combinations will be tested and evaluated under on-farm and on-station conditions. Successful crop and livestock system technology combinations will be documented and promoted, and their subsequent adoption by different groups of farmers will be monitored. Recommendations for targeted scaling up of successful technology combinations will be made based on evaluative modeling.

In order to predict the scalability of successful technologies, it is necessary to track adoption rates and to better understand the socio-ecological and cultural factors that condition such adoption. This information, furthermore, increases our understanding of how agricultural productivity can be sustainably increased. It is anticipated that most of the data collected and analyzed on the effectiveness and adoption of interventions will help to fulfill both the reporting requirements and the learning objectives of the AR M&E component.

10. Communication and Facilitation

To support the delivery of program activities and outcomes, the program will implement various communication, knowledge and information activities that will contribute to:

1. Communicating for wider influence and impact – Engaging with and influencing wide audiences;
2. Translating the program's outputs into research, development and policy outcomes, getting knowledge into use;
3. Knowledge sharing and learning – Enriching learning, interaction and exchange across the program;
4. Publishing – Capturing and disseminating research products and outputs of the program;
5. Internal communication – Linking and connecting project and program teams.

These activities will be undertaken across the program. Each regional project will have its own 'local' communication elements built into its activities. These are likely to mainly focus on 'communication for development' – ensuring that communication opportunities are taken up as an integral part of implemented R4D activities. In addition, a program-wide component, led by ILRI, will:

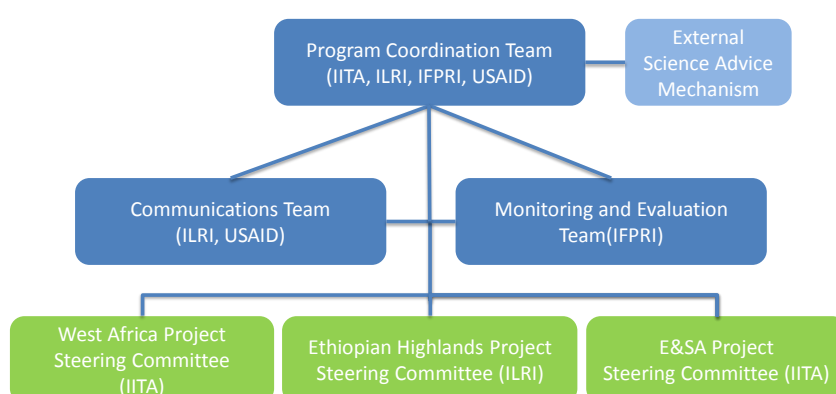
1. Provide an overall 'external' web face for the program – a web site where information about the program as a whole and the individual projects can be found. It would report on activities in the 3 projects as well as any cross-cutting activities. Regular news updates and announcements will be produced and communicated to international audiences.
2. Ensure that outputs from the program and projects satisfy emerging CGIAR guidelines on branding and that they are fed into the wider CGIAR knowledge base and digital dissemination systems.
3. Provide a framework and open platforms/tools to share products and results from the program and the individual projects. This includes an open photo and image-sharing space (on www.flickr.com), an account on www.slideshare.net for powerpoints to be shared, as needed a video sharing space (on <http://blip.tv>), and a document repository (at <http://cgspace.cgiar.org>).
4. Commission a photo-journalist and science writer to document activities and results for wide audiences.
5. Support and facilitate internal collaboration and communication across the program using online tools. The main priority would be to support exchange and communication across the program as a whole. Primary responsibility for internal communication in each project would be with the lead center in each region – we would encourage consistent use of tools and platforms across all the projects.
6. Support, facilitate and act in a 'secretarial' role to the 'program coordination team' and other program-wide mechanisms intended to provide consistency and coordination across the program.
7. Organize and facilitate an annual learning and out-scaling event bringing together partners from across the program and associated organizations. Participants will include researchers from the projects, other development actors, funders, and other national/regional actors likely to contribute to or benefit from the program's various actors. This would also act as a review and planning mechanism across the program as a whole. Participants would pay their own travel and time costs.
8. Support 'peer exchange/learning' visits for national scientists in the different projects to spend time visiting related projects in other regions.

11. Program Management and Coordination

The management structure is streamlined to emphasize timely and effective communication with a minimal administrative burden. The program initially has two basic levels: three regional Projects working together to form an overarching program. In Projects with multiple countries and languages, country-level groups may need to be established in the future, and at the program level, additional scientific advice and coordination may require establishing new groups (shown with dashed borders in the diagram below).

Management structure

The teams below have been formed to design, initiate, and manage the long-term research-for-development program. We are committed to ongoing learning and the Program Coordination Team and Project Steering Committees will consider the need for additional standing or ad-hoc groups, especially to ensure contributions from national agricultural research system expertise and private sector actors, to promote country-level communication and management, and to promote innovation.



Program Coordination Team (PCT)

The Program Coordination Team provides advice and coordination across three Projects. By integrating the three regional Projects into one coherent program, we hope that each region can benefit from the experiences and successes in other regions, and the program can magnify the inferential power of research in each region. The PCT:

- Advises USAID on program and Project progress.
- Tracks project reports and provides feedback and advice to the individual project management teams.
- Provides coordination and integration, but not supervision, across projects.
 - Convenes/sponsors/approves the research approach design process, including informal consultation with qualified external experts;
 - Sets standards and guidelines, approves objectives/outcomes etc.
- Facilitates good communications and learning
 - Advises on Communications and MET work plans;
 - Convenes/sponsors an annual program-wide learning meeting.
- Ensures coordination, alignment, and integration with related research projects.
- Meets annually face to face, plus virtually at least quarterly.
 - Reviews progress and advises Project Coordinators on work plans and budgets;
 - Communications Team plays secretarial role and reports on PCT meetings on program website.

- Takes decisions by consensus.
- Membership:
 - Chair: Rotates annually between IITA and ILRI
 - IITA Project Coordinator
 - ILRI Project Coordinator
 - MET lead
 - Communication lead
 - USAID Activity Manager

Monitoring, and Evaluation Team (MET)

The Monitoring and Evaluation Team coordinates across the three Projects and draws a separate budget for data management, site selection, M&E activities, and coordinating M&E reporting to donor(s)⁴. The MET:

- Ensures conduct of baseline surveys.
- Ensures the right indicators are used.
- Provides technical data and analysis for site selection.
- Conducts modeling for forward-looking impact projections, impact assessment, and intensification pathway analysis.
- Provides ongoing data management and analysis.
 - Provides an open-access data management and analysis platform
 - Provides monitoring reports and projections
 - Coordinates multi-scale M&E activities (program, Project, country, and sub-system levels) and reporting to donor(s), including compliance with Feed the Future M&E requirements
- Supports data management and reporting for semi-annual Project reports.
- Keeps PCT, Communications Team, and PSCs informed of activities.
- Led by IFPRI; comprises three Project M&E leads and 3 regional IFPRI M&E officers.
- Meets twice a year in person; attendance, funded by IFPRI.

Communications Team

The Communications Team facilitates, on demand, program meetings and communications, leads on public awareness, and hosts, populates, and maintains the program website, collaborative workspaces, and related communication platforms. It:

- Is led by ILRI-Addis Ababa.
- Facilitates meetings and communications.
- Leads public relations, website, and wiki.
- Provides a coordinated and consistent communications approach/strategy across the three projects and publicly on behalf of the program.
 - Manage single program web site and collaborative spaces, with document repository and associated platforms;
 - Produce program information materials;
 - Build productive relationships with USAID FTF and other related communication initiatives;
 - Ensures, as far as possible, that outputs from the program are documented, published and made widely accessible;
 - Ensure compatibility with USAID and CGIAR communications guidance.
- Supports PCT and Annual Program Learning Event (and other cross-project learning as demanded).
- On demand, provides facilitation services for all program and major project meetings.

⁴ The quarterly financial and project biannual reports will come from the Project Coordinators. The required annual FTF M&E reporting (on FTF indicators, program narratives, etc.) will be coordinated by the MET on behalf of each Project.

- Facilitates broad participation in program and project work.
 - Draws in communications expertise from partners;
 - Promote the effective use of knowledge, communication and ICTs within the projects;
 - Provide email communication when required for program and project partners without adequate web access;
 - Facilitates peer-to-peer learning;
- Keeps PCT, MET, and PSCs informed of activities.

Project Steering Committees (PSCs)

At the regional Project level, Project Steering Committees provide advice and oversight of research, budget, work plan, and communications, ensuring that each Project conforms to program objectives and the Program Framework. The initial CGIAR representatives will be appointed by the Chairs, advised by the Project Coordinator. Thereafter, representative will change every 12 months (but will not include the lead center for that project).

Each of the three regional Project Steering Committees:

- Provides advice and oversight on Project activities
 - Provides science guidance to project implementers to ensure conformity with Program Framework and program objectives
 - Guides Project planning and activities
 - Approves annual Project workplan and budget
 - Oversees coordination between project components and partners
 - Liaises with MET to oversee M&E; cc PCT on all reporting
 - Keeps PCT informed of activities via the Project Coordinator
- Reviews and makes suggestions to Project Coordinator on semiannual technical progress reports to USAID
- Plans yearly stakeholder meetings with support from Program Communications Team.
- Decisions made by consensus.
- Meets annually in personal and virtually as called by the Chair.
- Membership:
 - West Africa PSC
 - Chair: IITA
 - Project Coordinator, serves as Secretary
 - Project Chief Scientist
 - Project M&E Lead
 - Project Communications Lead
 - Research partners: CGIAR (1), CORAF (1), NARS (1), AGRA (1)
 - USAID Activity Manager
 - Ethiopian Highlands PSC
 - Chair: ILRI
 - Project Coordinator and Project Chief Scientist
 - Project M&E Lead
 - Project Communications Lead, serves as secretary
 - Research partners: CGIAR (1), NARS (1), and others as designated;
 - ATA
 - USAID Activity Manager
 - East and Southern Africa PSC
 - Chair: IITA
 - Project Coordinator, serves as Secretary
 - Project Chief Scientist

- Research partners: CGIAR (1, rotating annually), sub-regional research organizations (ASARECA/SADC/ CCARDESA) (1), NARS (1), and others as designated
- Project M&E Lead
- Project Communications Lead
- USAID Activity Manager

External Science Advice Mechanism

During FY 13 (calendar year 2012-2013), mechanisms will be put in place to solicit external scientific advice from an informal group of experts. In early-mid 2013, the PCT will consider the need and modalities and composition of any standing or advisory group(s) to give scientific advice and foster linkages and alignment of Africa RISING with other related research

Program and Project Meetings

In conjunction with a major yearly event around May each year, the PCT will convene a yearly program-wide learning event, review program progress, and advise the Projects on necessary adjustments in work plans and budgets. The PCT will also annually review the program and Project management structure.

Each Project Steering Committee will convene an annual project review and planning meeting with the project implementers (at the end of each implementation year ~November). In continuation of this meeting, the PSCs will convene broad stakeholder meeting to foster alignment and build opportunities to scale. This meeting would include reps from the relevant Ministries, NGOs, private sector, regional organizations, farmers' organizations, USAID missions, USAID Washington, etc.

The dates and locations of program and Project meetings can be found on the Africa RISING website: <http://africa-rising.net/>

12. References

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