



Africa RISING in Ethiopia

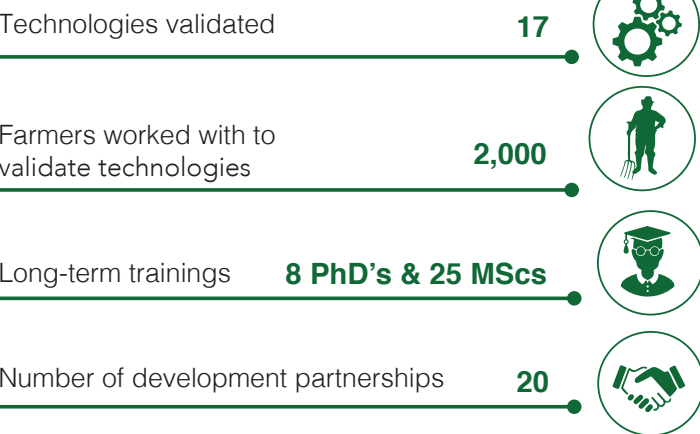
Creating Sustainable Systems for Agriculture



Country brief - March 2019



Outcomes



Research-in-development scope

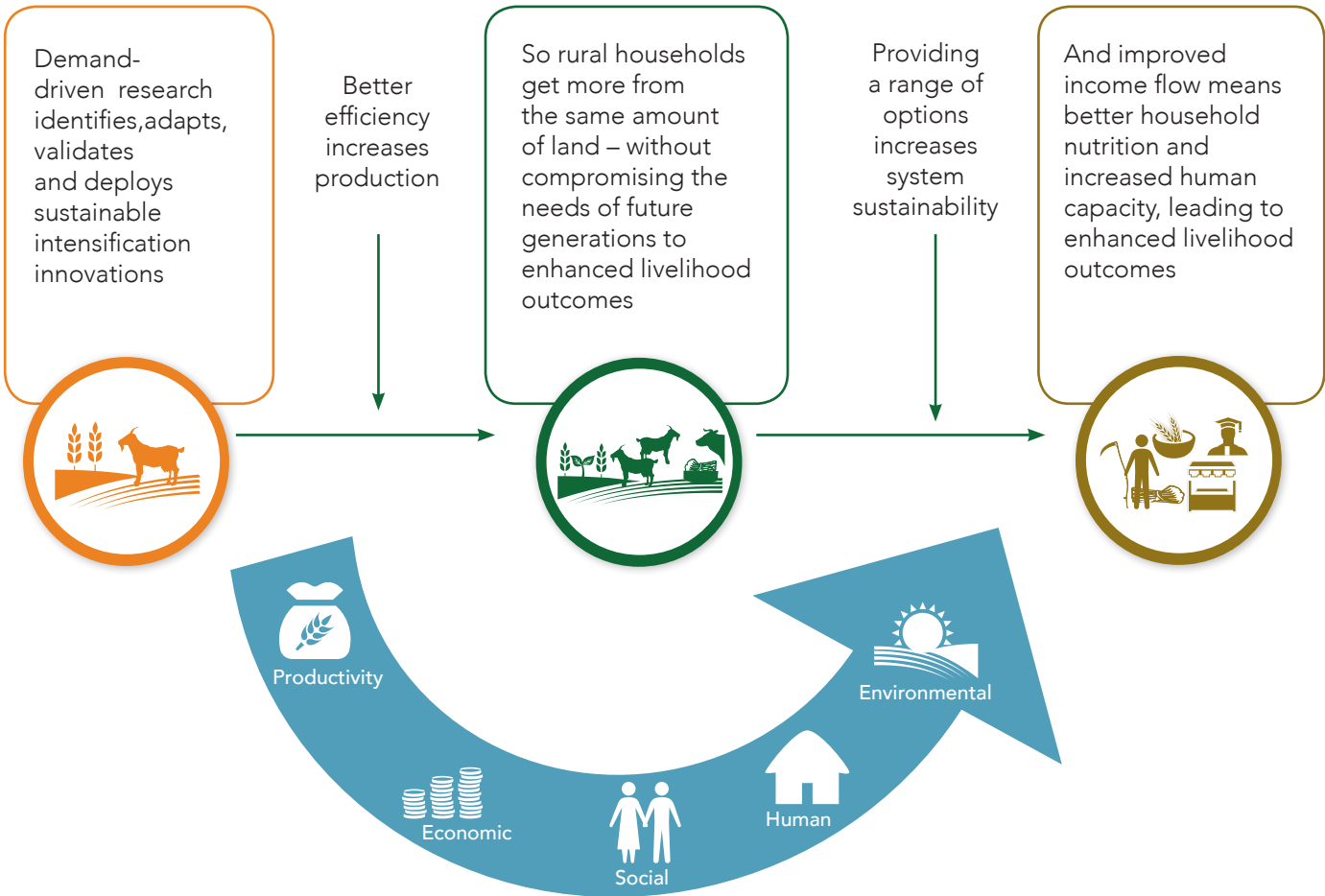
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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 1. Cropping systems <ul style="list-style-type: none">VarietiesCropping systems management | 4. Human condition <ul style="list-style-type: none">NutritionGender equity |
| 2. Livestock systems <ul style="list-style-type: none">FeedingFeed processing/formulation | 5. Mechanization <ul style="list-style-type: none">Post-harvest handlingField preparation |
| 3. Natural resource management [NRM] <ul style="list-style-type: none">Soil & water conservationWater lifting, harvesting and delivery | |

*Appropriate technologies are integrated within and across the components above.

Technology delivery

Sustainable intensification domains <ul style="list-style-type: none">ProductivityEnvironmentEconomicHuman conditionSocial	Collaboration <ul style="list-style-type: none">CGIAR centersNARSFarmersPrivate sectorUniversitiesExtension servicesGovernment agencies	Capacity building <ul style="list-style-type: none">Short term trainingPost-graduate training [MSc, PhD]Exchange visitsFarmer field days
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Africa RISING's theory of change



Multiple sustainable intensification domains in an enabling policy environment result in long-term equity and viability



1 Cropping systems

> Varieties

- o Cereal evaluation for bread wheat, durum wheat, food barley, and malt barley. A total of 113 varieties were evaluated and promising ones selected by farmers through participatory varietal selection (PVS). Each of the improved varieties (for each crop) selected by farmers yields at least double the national average grain yield.
- o Pulse variety evaluation including faba bean, field pea, lentil, and chickpea. A total of 65 varieties were evaluated and promising ones selected by farmers through participatory varietal selection (PVS). Each of the improved varieties (for each crop) selected by farmers yields at least double the national average grain yield.
- o Variety evaluation for potato. Over 30 potato varieties were evaluated, and improved varieties selected by farmers gave yield 3 - 7 times higher than the local varieties (25 - 65 t/ha vs 8 - 10 t/ha) under good agricultural practices. They are also early maturing (98 vs. 120 days) and are tolerant to late blight.
- o High value fruit trees. 6 varieties of improved avocado (*Percia americana*) and improved apple (*Malus domestica* Borkh) varieties have been introduced to Africa RISING sites.

> Cropping systems management

- o The project identified soil-specific best fertilizer blends and rates for wheat in eight research kebeles. New recommendations boost yields 2-3 times, even in previously "non-responsive" soils. A decision support tool for appropriate fertilizer recommendations to support fertilizer blending plants and regional governments has been produced.



2 Livestock systems

> Feeding

- o Intercropping forage with faba bean: Intercropping improved forage with food crops like faba bean showed that farmers can harvest quality forage from their crop fields during critical feed shortage times while maintaining the balance between grain and fodder. In the Africa RISING sites, field trials showed that when oat forage is intercropped with faba bean, it is possible to obtain about 2.6 tons of good quality forage DM/ha (10% CP) without significantly affecting the grain yield of the faba bean. Economic analysis of this practice also showed that intercropping significantly improves whole plot productivity.
 - o Supplementary forage from rain-fed/ irrigated oat-vetch mixtures: The intercropped fodder yielded 11–19 tons/ha dry matter (DM) under rain-fed conditions, with 15% crude protein (CP) and 9.5 Megajoules of metabolizable energy/kg DM. Supplementation of 1-2 kg DM oat-vetch mixture to dairy cows has a potential to give 1.5-2 liters of extra milk to farmers.
- ### > Feed processing/formulation
- o Africa RISING has worked with farmers to develop ration formulation guidelines for mixing crop residues with oat - vetch mixtures and lucerne leaf to improve the utilization of available feed resources and increase livestock productivity based on nutritional composition of feeds.



3 Natural resource management (NRM)

> Soil & water conservation

- o Hydrological stations were established at landscapes treated with and without soils and water conservation/water harvesting options. The land scape managed with integrated SWC practices has reduced soil loss by over 80%. At plot level, management practices implemented on cultivated fields reduced soil loss by 87% compared to non-treated plots.
- ### > Water lifting, harvesting and delivery
- o Improved water lifting technologies enhanced farmers ability to irrigate high value crops and improve household nutrition. Irrigated fodder biomass increased dry weight by 14% when farmers were guided in their irrigation practice by wetting front detectors.



4 Human condition

> Nutrition

- o Results from an Africa RISING survey of 240 mothers with children under five revealed that malnutrition is a significant problem in Africa RISING intervention households with rates of stunting, underweight and wasting at 37%, 12% and 6% respectively in Basona, Worena and Sinana districts.
- ### > Gender equity
- o Africa RISING gender studies in Ethiopia have shown that: there is relative equitable land distribution, equity is yet to be achieved in decision-making and asset control, women have limited access to manure for soil fertility management, women work longer hours compared to men, there are discrepancies in access to information and extension services due to cultural norms and inadequate access to credit lowers women's access to farm inputs, such as seeds, tools and fertilizers.



5 Mechanization

> Postharvest handling

- o The project has worked with farmers to develop improved feed troughs and storage structures which reduce feed wastage during utilization and storage by about 30–50%.
 - o Diffused light stores (DLS) introduced by Africa RISING increased the capacity of farmers to store potato by 240 tons thereby reducing postharvest losses greatly thereby allowing farmers to earn income by selling as seed or use the material themselves.
- ### > Field preparation
- o Multipurpose two-wheel drive tractors (2 WT) that can be used for wheat and maize planting, wheat harvesting, maize shelling, wheat threshing, water pumping, and as trailers have also been introduced to farmers. The 2 WT shellers reduce shelling costs by up to 50% and is able to process three tons of maize grain per hour. Introduction of the 2 WT has seen some farmers transform into 2 WT service providers within their communities. This offers promising adaptation strategies and resilience options in the face of climate change.



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 is creating 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.

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