

Photo report: Africa RISING management
team field visit to Malawi [February 2018]
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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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Introduction

In mid-February (15 – 17), the Africa RISING program management team led by the project manager, Irmgard Hoeschle-Zeledon, the east and southern Africa (ESA) project chief scientist and implementing project partners visited project sites in different extension planning areas (EPAs) in Malawi. The three-day visit reviewed the implementation of project activities and assessed how farmers were applying some of the technologies promoted by Africa RISING over the past six years . During the visit, the management team interacted with farmers and got first-hand feedback from farmers on how they were using each of the technologies. This photo report presents highlights what the team found. An online version of this photo report is also accessible at: <https://spark.adobe.com/page/6mgR6jpa6wpVG/>

Improving access and availability of quality legume seed

Building resilient farming systems through quality declared seed (QDS) production by local farmers is one of the key focus goals of the Africa RISING project in Malawi. For a majority of farmers, access to good groundnut seed that germinates well is still a significant challenge. This year, Africa RISING is working with about 300 farmers in 4 districts (Dedza, Linthipe, Machinga and Mangochi) to multiply groundnut and soya bean seeds. Each farmer got 15 – 20 kg basic seed of either soya bean crops to multiply. This activity is currently in its second year. At the beginning of each season, the farmers are trained on good agronomy and the tenets of seed multiplication for both groundnut and beans. The aim of this activity is to ensure farmers can locally produce quality declared seed (QDS) that is as good as or better than the certified seed. Through the initiative, some farmers in Linthipe and Ntubwi extension planning areas (EPA) were recognized by the Ministry of Agriculture - Seed Services Unit as registered seed producers. The germination of groundnut QDS by the Africa RISING farmers has been >90% during the current 2017/2018 cropping season.

In the previous season, Africa RISING bought the QDS seed from all the farmers who worked with the project at double the market price of the grain seed. The seed bought by the project was then distributed to other farmers for use in the project's ongoing trials and demonstrations.



A group of women farmers producing QDS seed as part of Africa RISING activities in Linthipe EPA in Malawi. Photo credit: Jonathan Odhong/IITA.

Bean seed

As part of the scaling plans of the Africa RISING project in Malawi, new bean varieties are being demonstrated and evaluated on farmers plots. The varieties being tested are drought tolerant, nutritious (high in iron and zinc) and suitable for the export market. The results from the performance of these demonstrations/evaluations and the farmer preferences and opinions about the different varieties will provide a basis for the Africa RISING team to select the main bean varieties to scale out to thousands of farmers within the project sites. The target is to produce up to 10 tonnes of bean seed under irrigation off-season in readiness for the scaling out activities in the next season. The demonstrations have been ongoing for the past two years in different locations within Linthipe EPA.

Groundnut and soya bean seed multiplication



Photo credit: Jonathan Odhong'/IITA.

Asked whether they would sustain seed production if Africa RISING project were to close, the farmers responded in the affirmative.

'We have no reason to worry about that because typically the selling price of seed is usually higher than that of grain. It even gets better when it is a sought-after and well-performing variety,' says Aness Kaole, one of the Africa RISING groundnut QDS farmers in Linthipe EPA.

Productivity and stability analysis for sustainable intensification of maize cropping systems

Alfred Jason is one of the farmers involved in the productivity and stability trials for maize cropping systems in Mkuwazi Village, Linthipe EPA, Malawi. According to Jason, 75 cm spacing between the ridges and cereal-legume rotation in subsequent seasons are the two most significant learnings that he implements on his other farms.



Photo credit: Jonathan Odhong'/IITA.

Dryland cropping systems in Africa are facing major challenges due to rainfall variability that is compounding the already dire conditions of poor soil fertility and inadequate investments in farms. Application of technologies that enhance crop productivity and stability through efficient use of nutrients and soil moisture for different agro-ecologies and season types is foundational for food security. The Africa RISING Malawi team is implementing studies to assess how integration of grain legumes enhances maize productivity and stability under variable soils and agro-ecologies. At the end of the 2017/2018 season, the team will have gathered six years' worth of data across three agro-ecologies in central Malawi. The treatments include: unfertilized maize, mineral fertilizer application, and maize sequenced with soya bean, groundnut, or groundnut/ pigeon pea intercrop or continuous maize/pigeon pea intercrop.

Food legume budgeting and processing for dietary diversity in agricultural intensification



Photo credit: Jonathan Odhong'/IITA.

Linking the production of grain legumes (groundnuts, pigeon peas, cowpeas, beans) and local level processing to ensure dietary diversity is an integral component of agricultural intensification initiatives. Households are provided with information on their nutritional requirements over a 12-month period which they can use for decision-making on quantities that must be retained on the farm. Often, farmers sell the bulk of the legume produce, leaving little for household consumption, at best lasting only six months of the year. As part of this activity, farmers in the project sites are trained on: (1) food and nutrition principles (foods and nutrients; the six food groups and dietary diversity, infant and young child feeding practices), (2) achieving dietary diversity (diversity in production, dietary diversity through food selection and purchasing), and (3) food budgeting and storage (PICS bags, aflatoxin management, minimizing food loss and wastage). The training sessions are currently conducted in 4 EPAs – Kandeu, Golomoti, Nsipe and Ntiya. So far, 631 farmers have benefited from nutrition training. While a majority of the trainees are still women, the men are also increasingly getting involved.

'Initially when the training started we were not involved, but now we get invited and have actually been taking part in the sessions. For us this is a privilege to be involved, so that we can support our women better,' said a male farmer during the demonstration of nutrition activities.

Processing of legumes into dhal (dried, split pulses that is usually cooked with beautifully vibrant spices into a thick delicious stew) ensures that a proportion of the legumes budgeted for the household is no longer available to be sold at the expense of household consumption. Dhal can be stored for more than six months without the need for chemical treatment, provided they are kept in a dry environment. The processed products help to

reduce subsequent food preparation time since women do not have to start from scratch with each ingredient when preparing meals.

Two-step flow of nutrition knowledge

1. The project selects and trains the mother farmers on the three topics outlined.
2. The mother farmer (now a trainer) then transfers the knowledge she gained to baby farmers under her care (usually five other women). The training sessions offered by the mother farmers are usually guided by a facilitator's training manual that has been translated into Chichewa by the project for quick reference.

Improving goat housing and feeding for productivity gains



Photo credit: Jonathan Odhong'/IITA.

Goats constitute the largest source of meat in rural Malawi. Farmers who own goats get lucrative returns when they fatten them around festivals when demand soars. The Africa RISING Malawi team is implementing interventions that would result in improved productivity while reducing the crop-livestock conflict within the project sites. These interventions involve farmers who have also taken up Africa RISING technologies to intensify production of legumes like pigeon pea. These interventions are still at the validation stage and in addition to assessing the impact of improved housing structures, the project team is also evaluating: (1) how locally available feeds can be used to develop feed rations that provide key minerals to goats (2) how to improve the local goat breed by breeding local does with newly introduced boer buck goats, and (3) the combined impact of these treatments on the growth rate.

For a start, the project team has worked with the farmers to design and build cost-effective sheds for the goats. Next, they plan to start doing training on feed conservation with the farmers as a means of initiating the training sessions on using locally available feed resources.



Photo credit: Jonathan Odhong/IITA.

'The concept of this new goat house was very amusing to us at the beginning. But now we understand the reasons behind certain things, for example why there is a 'room' for the male goat alone, a 'room' for the kids, another one which we now call the 'maternity room' for the female goats, a 'sick bay' for the ones that are unwell, and a 'living room' too,' says Jeya Wani with a chuckle. She is one of the 79 farmers (24 men) in Kanganya Village in Linthipe EPA that are implementing the improved goat housing and feeding intervention.

Water and nutrient management experiments



Photo credit: Jonathan Odhong'/IITA.

Over the past two years, the Africa RISING Malawi project has also been working with farmers to evaluate the linkage between soil and water conservation techniques to nutrient productivity across the rainfall gradient in Machinga EPA. Farmers are implementing different treatments that will help the team establish the value of tied ridging and fertilizer application rates (full or half) on different crop combinations for maize, groundnuts and pigeon peas. The trials are taking place in three villages within Machinga, namely: Ntubwi, Nsanama and Nyambi. These sites range from 500 m above sea level (in Ntubwi) to 900 m above sea level in Nyambi. These differences make up the varied agro-ecologies in which these trials are being conducted. Additionally, these experiments are also designed to establish the rotational benefits of legumes after the second year in a system.



Beatrice Amosi and her husband Simon Kayisi are producing quality declared groundnut seed in Ntubwi EPA for the second year in a row. Photo credit: Jonathan Odhong'/IITA.

'Before starting groundnut seed production, we were trained on various requirements for groundnut QDS seed production. The planting ridges have to be 75 cm apart, and before planting we have to flatten the top of the ridges. We also got training on how to tie our ridges properly for moisture conservation. We used a 10 cm stick for the measurements,' explains Amosi.



Two women farmers admire a soya bean QDS production plot in Ntiya EPA, Mangochi District. Photo credit: Jonathan Odhong'/IITA.



Joseph Spanga, a soya bean QDS farmer in Nyambi EPA, Machinga District. Photo credit: Jonathan Odhong'/IITA.

'My neighbours really admire my QDS field. Many of them after seeing how well the soya bean has established have requested to also have the seed variety I am using,' explains Spanga 'So far soya bean QDS production has proved to be profitable for me and my plan is to continue with this even after the project,' he adds.

Please do not take away our “husbands!”

Bringing farmers round to engage in QDS production has not been easy. In late 2016, when the Africa RISING team approached the first batch of farmers in Lungwena EPA, a majority of them were skeptical. Some in fact dismissed the whole idea altogether. This reaction was due to a bad contractual arrangement for groundnut grain production with an unnamed entity two years earlier. For most of the farmers, this experience would eventually turn out to be a 'trap' that they regretted getting into. In the arrangement, the farmers were given groundnut seeds to grow (on behalf) of the entity, while the entity on its part had committed to buy all the grain produced by farmers at the best market prices. However, in the cropping season, there was a major drought and most farmers did not get any harvests. To recoup their investments with the farmers, the entity went ahead to take away a goat from each of the farmers whose crops had failed. Some of the affected women farmers were widows and to them, the goats had become their 'husbands' because they provided a sense of financial security because they could easily sell them at a profit whenever they had a pressing financial need.



Regis Chikowo taking time to remind the farmers to always get rid of the 'witch weed' (striga) as soon as they spot it growing on their farm.

Nitrogen response trials combined with comprehensive weather data



Africa RISING is implementing trials that will eventually provide guidance for farmers on nitrogen application rates. Often, farmers make investments in nitrogen that are not warranted depending on the season type/outlook. Whilst nitrogen is one of the most limiting soil nutrients, uninformed application of the same also results in a lot of crop losses. In these nitrogen response trials, the project has also installed a weather station which is also collecting information on air temperature, wind speed and direction, relative humidity, dew point, rainfall, soil moisture, solar radiation, and barometric pressure. These are vital as a source of detailed weather data that is critical for running detailed crop growth models, which operate on a daily time step, requiring daily inputs of radiation, temperature, and rainfall at the minimum. Armed with this information, the project team will be in a better position to investigate the robustness of technologies that can be deployed to mitigate the effects of frequent droughts and to build farmers' resilience. They will also be sharing the weather data periodically with the Malawi meteorological services as a public good.

Turning dreams into reality



Enelesi Juma, one of the QDS farmers working with Africa RISING in Nsanama EPA, Machinga District. For the second year she has seen the benefits of seed production first hand. In 2017, her total earnings from selling groundnut QDS seed from her 0.5 ha farm was Mk 162,000 (USD 223). This year, she expects to earn even more (approximately Mk 200,000), considering the increasing demand. Enelesi and six other farmers who are also producing groundnut QDS seed have formed a group for joint marketing of their produce.

'Venturing into QDS production has done wonders for my family. With income earned from selling my groundnut QDS, I was able to take the first step toward getting electricity connected to my house by paying for the carrier poles to be installed. This year, I will use the income I earn to complete the process,' explains Enelesi with a determined look.

Using drones to gain in-depth understanding of agroecosystems



Photo credit: Jonathan Odhong'/IITA.

One of the objectives of the Africa RISING project in Malawi has been to build resilience in smallholder farming systems in central Malawi. However, to be able to proffer interventions that will achieve the goal of reliance-building requires deeper understanding of cropping systems beyond the biophysical elements. To take their efforts a notch higher, the project team has partnered with scientists from the Michigan State University to use drones as a means of quantifying the carbon stocks through Normalized Difference Vegetation Index (NDVI) imaging across agro-ecologies.