

Photo report: Africa RISING management
team field visit to Zambia [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

The Africa RISING East and Southern Africa (ESA) project management team led by the project manager, Irmgard Hoeschle-Zeledon, the ESA project chief scientist, Mateete Bekunda and implementing partners recently (12 – 14 February) visited project sites in various camps in Chipata District, Zambia. The goal of the two-day visit was to review the progress of activities and to assess how technologies were being used by farmers. Additionally, the 2017/18 cropping season was also in principle a season which had been earmarked by partners as one for 'closing' existing research information gaps for all the technology options offered to farmers to ensure that all relevant information required for effective scaling in future was available. The management team interacted with farmers and got first-hand feedback about how they were using each of the technologies and improved practices put forward by the project. This photo report highlights what the team found. An online version of this photo report is also accessible at:

<https://spark.adobe.com/page/CfXHi9RvkbYbO/>

Benefits from doubled-up legume in conservation agriculture

Demonstrations on doubled-up legume– intercropping two grain legumes with different growth habits – have been ongoing with farmers in Africa RISING Malawi since 2013. As part of technology transfer, this practice which was already showing great impact in Malawi was introduced by the project team to Zambian farmers in 2014/2015 cropping season as part of the conservation agriculture practice that is already widely adopted by farmers in the Eastern Province of Zambia.

Julius Mshanga, a farmer from Kapara Camp in Chipata District is working with the Africa RISING project team on the doubled-up legume under conservation agriculture (CA) practice trials. As part of these trials he is also implementing seasonal legume-cereal crop rotations as a means of ensuring effective nutrient cycling. Mshanga says that he has seen first-hand what difference the rotations make when implemented in a double-up legume CA system.



Julius Mshanga at his farm. Photo credit: Jonathan Odhong'/IITA.

'Take a look, this part of my farm where the maize is really healthy and green is where I planted pigeon pea and groundnut last season,' he says, pointing at a portion of his farm where the maize is lush green. 'Also looking at the different experiments on my farm, it is not lost on me that pigeon pea seems to fix nitrogen better on the soil compared to groundnut,' he adds. Mshanga also notes that conservation agriculture is better than conventional practices (using ox driven ripper, for example) particularly in seasons where there is a drought. 'Last year– 2016/2017 season—we had a drought in Zambia and most of the crops withered particularly on parts of my farm where I had prepared the land using the ox driven ripper and taken out all the crop residues from. But on the same farm, the side where I did CA, the crops there survived and there was an obvious difference to me in the two sections of my farm even eventually when I harvested,' he notes. 'I must also add that implementing CA and rotations on my farm have turned me into a believer in the two. At

first, I was very doubtful and argumentative with the extension officer who had picked me to be a model farmer in this camp for these two practices,’ explains Mshanga with a smile.



Photo credit: Jonathan Odhong’/IITA.

Mathias Phiri (pictured), a farmer from Mtaya Camp in Chipata District has been involved in conservation agriculture and doubled-up legume trials cumulatively for the past five years. Phiri was introduced to the double up legume technology in 2014 (in addition to CA) and has seen some interesting improvements in his yields since.

‘I am happy to implement the doubled-up legume technology because I have confirmed it improves soil fertility and also offers me different options at harvest. For example, I use the pigeon pea grain sometimes as a relish while the groundnut can be sold and the maize is used as a staple. This intercropping allows me to harvest three crops from the same plot,’ he says.

Asked how he knows that soil fertility has improved in his 2 ha farm; Phiri’s answer is simple – ‘The fact that I can now see that the soil is much looser at planting is a good sign,’ he says. He also admits that reduced labour is a significant factor informing his decision to prefer doubled-up legume in CA over the conventional ox ridge tilling. Additionally, he also notes that the seasonal rotation of cereal-legume crops also accounts for the impressive performance he has seen on his farm over the past three years.

‘One of my bigger challenges is still finding markets. Selling our pigeon pea produce is still difficult. For example, I currently have about 50 kg of pigeon pea at my home that I have had intent to sell, but there are no buyers. On the other hand, while groundnuts are relatively easy to sell, prices are usually low thereby even compounding our challenges,’ adds Phiri.

Africa RISING project in Zambia is implementing these doubled-up legume and CA trials with 7 farmers in 6 camps within the Chipata District in the Eastern Province of Zambia.

Green manure cover crops



Photo credit: Jonathan Odhong'/IITA.

Zandonda Mbewe (pictured) , is hosting Africa RISING green manure cover crop trials (GMCC) on his farms for the second season. He is experimenting with the following GMCC options:

- maize intercrop with cowpea
- maize intercrop with pigeon pea
- maize intercrop with lablab
- maize intercrop with *Gliricidia*

Green manure cover crops offer farmers various benefits such as suppressing weed growth and creating surface cover that helps in keeping the soils moist for longer. Additionally, having crops like lablab and cowpea ensures that a farmer can harvest some extra grain for home consumption too. On the other hand, *Gliricidia* is beneficial for making compost manure as well as helping with soil fertility improvement. Asked which of the GMCC options he prefers, Mbewe said that he favours the maize intercrop with cowpea because this combination seems to build better soil fertility compared to other GMCC alternatives. Additionally, it offers extra cowpea grain for home consumption. In terms of ground cover, moisture conservation and weed suppression he prefers the lablab GMCC alternative which he says is much better in this regard.

Improving the legume seed delivery systems in Zambia

The International Institute of Tropical Agriculture (IITA), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the Zambian Agricultural Research Institute (ZARI) are partnering under the Africa RISING going to scale in eastern Zambia project to make high-quality legume seeds accessible to smallholder farmers in Zambia. The focus legumes of the project are: cowpea, pigeon pea, soya bean, and groundnut. Under this activity, the breeder seed produced from ZARI are passed to private sector producers of foundation seed. The foundation seed is then fed into a network of certified seed producers that include seed companies and community-based seed outgrower schemes.



The ZARI Chipata Station head, Kennedy Kanenga (left), congratulates Thomas Mtonga for a job well done in multiplication of certified pigeon pea seed (variety MPPV2). Photo credit: Jonathan Odhong/IITA.

To meet the demand for seed, ZARI is partnering with willing and interested farmers like Mtonga to produce certified seed. The need to enter this kind of partnership arrangements with farmers became clear last year (2017) when ZARI could not meet a 22 metric tonnes demand for pigeon pea.

Farmers like Mtonga are helping to relieve the pressure of producing certified seed from ZARI thereby allowing the institute to focus on production of basic seed. For farmers like him, this partnership equally portends a profitable venture whereby he is guaranteed of selling back the seed after certification by government inspectors to ZARI at an agreeable price to both parties. Although it is the first time Thomas has participated in pigeon pea seed multiplication, he is expecting to harvest xxx tonnes out of the 1 ha planted.

‘The fact that the market for my harvest is assured makes this a perfect venture for me compared to growing maize for example. I have strived to follow all the outlined requirements stipulated by ZARI for seed multiplication and expect that the seed produced from my field will be easily certified,’ explains Mtonga. ‘Another reason that makes this interesting for me is that at the end of this season I will just be expected to ratoon the pigeon pea so this same crop will serve me into the next cropping season too,’ he adds.

This is the first time ZARI is implementing this kind of strategy for pigeon pea seed multiplication, but in previous seasons they have done the same for other legumes such as beans, soya bean and cowpea as part of efforts by the institute to address the persistent legume seed shortage in the country. This goal closely aligns with the activities of the Africa RISING going to scale in the Eastern Province of Zambia.

Demonstrating and promoting newly released groundnut varieties and improved management practices

The Africa RISING Zambia team is also working with farmers to promote and demonstrate five Feed the Future groundnut seed varieties that were released in 2017. The aim of the exercise is to check the performance of the released varieties under farmer management in different locations. Bisalom Banda, a farmer from Chiparamba Camp in Chipata District is one of those involved in this initiative. During the selection of varieties, the farmers look out for various criteria for variety selection like grain size, taste, early maturity, the number of pods produced per plant etc. During these exercises are typically done by both men and women separately and then results compared.



Bisalom Banda. Photo credit: Jonathan Odhong'/IITA.

Once Banda and his fellow farmers in Chiparamba identify and select the preferred groundnut variety at the end of the season, this information will be provided to ZARI who will then start to supply the 'winning' seed to farmers within that location (Chiparamba Camp) for propagation through the community seed banks. According to Banda, setting up the tied ridges (or 'ma boxy ma boxy' as the farmers call them) for moisture conservation is also a good management practice that he thinks would make a big difference in a season with erratic rainfall like the previous one. An extension of this activity is to also promote the production of quality declared seed of these five varieties by farmers. The production of QDS is being implemented in collaboration with 150 farmers in three districts within the Eastern Province of Zambia – Chipata, Katete and Lundazi.



Farmers Outgrower Foundation coordinator, Whyton Sakala (centre) poses for a photo with Edward Zulu (left) one of the outgrower farmers working with the foundation to produce certified seed in Chanje Camp, Zambia's Eastern Province. Photo credit: Jonathan Odhong'/IITA.

The Farmer Outgrower Foundation (FOF) partners with individual farmers to produce certified seed. This season (2017/18) FOF provided farmers with two varieties for multiplication – Wamusanga (500 kg) and MG 7 (150 kg). FOF then contracts trained farmers in seed growing, giving them 20 kg each to produce the certified seed. 'In this area (Chanje Camp), we are working with 25 smallholder farmers (19 women) to produce certified seed,' explains FOF coordinator Whyton Sakala.

'FOF is working currently with 50 farmers and is introducing them to newly-released improved groundnut varieties. However, through other initiatives we are working with a total of 1,000 farmers in the Eastern Province of Zambia using groundnut as a means of helping them get out of the poverty cycle,' adds Sakala.

In this arrangement, FOF trains the contracted farmers on all the stipulated standards for certified seed production and then gives each of them 20 kg for planting. In the course of the

season, seed inspectors conduct visits to the farmer's fields to evaluate whether all standards are met. If all standards are met, then the farmers produce is certified as seed. FOF recovers their seed investments at a ratio of 1:2 after harvest and then buys off the rest of the certified seed from them.

At the time of the visit, FOF and the farmers had not agreed on the selling price for the seed – an issue which ideally should be determined before farmers and FOF finalize their agreement. However, the situation has been complicated by the fact that the seed price in Zambia is not fixed. As a general principle, and a reason for optimism for the farmers, is that the selling price for seed is always higher than that for grain.

At the end of the visit, the Africa RISING management team urged FOF to (in future) establish a minimum selling price with the farmers before a final contract between the two parties is agreed. An idea floated by Share Africa based on their experience making similar arrangements with farmers was that the contract should stipulate that the farmer is bound to sell to the company (FOF/Share Africa) and that the selling price, for the farmer, will be 50% more than the price of commercial grain.

Some criteria for selecting outgrower farmers

- Has productive land.
- Field isolation – no neighbouring fields within a distance of 5 m should be having groundnuts growing on it.
- Willing to follow and maintain the high standards prescribed for seed production



Chasaya Sanga, one of the women FOF outgrower farmers producing certified seed in Chanje Camp, Eastern Province Zambia. Photo credit: Jonathan Odhong'/IITA.

'From what I can observe, the groundnut variety provided to me by FOF (Wamusanga) is fast growing and it is better-yielding considering the number of pegs into the ground that it has already established compared to the older varieties at the same stage,' notes Chasaya.



This mechanical groundnut sheller [driven by hand] has been introduced at a limited scale to farmers as a means of aiding them in processing their harvests. The machine is popular with farmers, however, the absence of a local fabricator in Chipata District is a barrier to its widespread adoption despite the high interest from farmers. Photo credit: Jonathan Odhong'/IITA.

Soya bean seed multiplication

The Africa RISING project is also collaborating with Share Africa Zambia in Soyabean Seed Multiplication. Through the arrangement, Share Africa purchases basic seed from IITA for production of certified seed. During the trip, the Africa RISING management team visited the Share Africa's 46 ha model farm in Chitandika Camp. Like the Farmers Outgrower Foundation, Share Africa also has its network of outgrower farmers with whom they collaborate to produce certified groundnut and soya bean seed for the market. Their eventual ambition is to eventually establish Share Africa as a legume seed company in the Zambian seed market.

Keeping the legume seed pipeline running

At the ZARI Msekera research station efforts are ongoing to further test other soon-to-be released groundnut, pigeon pea and soya bean varieties, multiply soya bean and groundnut breeder seed. Trials are also underway to validate options for optimizing pigeon pea seed production through ratooning. ZARI aims to produce four tonnes of breeder seed this season.



Irmgard Hoeschle-Zeledon and Mateete Bekunda. Photo credit: Jonathan Odhong'/IITA.

Debrief with USAID Zambia Feed the Future coordinator

At the end of the site visits, the Africa RISING management team and project partners held a debrief meeting with the USAID Zambia FtF Coordinator, Harry Ngoma. The team appraised Mr Ngoma about the observed progress of various activities and the farmer adoption and adaptation of the different technologies. Discussions at the debrief also touched upon future outlook for activities in light of the Feed the Future strategy for Zambia. In the end, partners took time to express gratitude to the USAID Zambia Country Mission for their steadfast support to ensure Zambian farmers get access to improved agricultural technologies that are changing their lives for the better.

