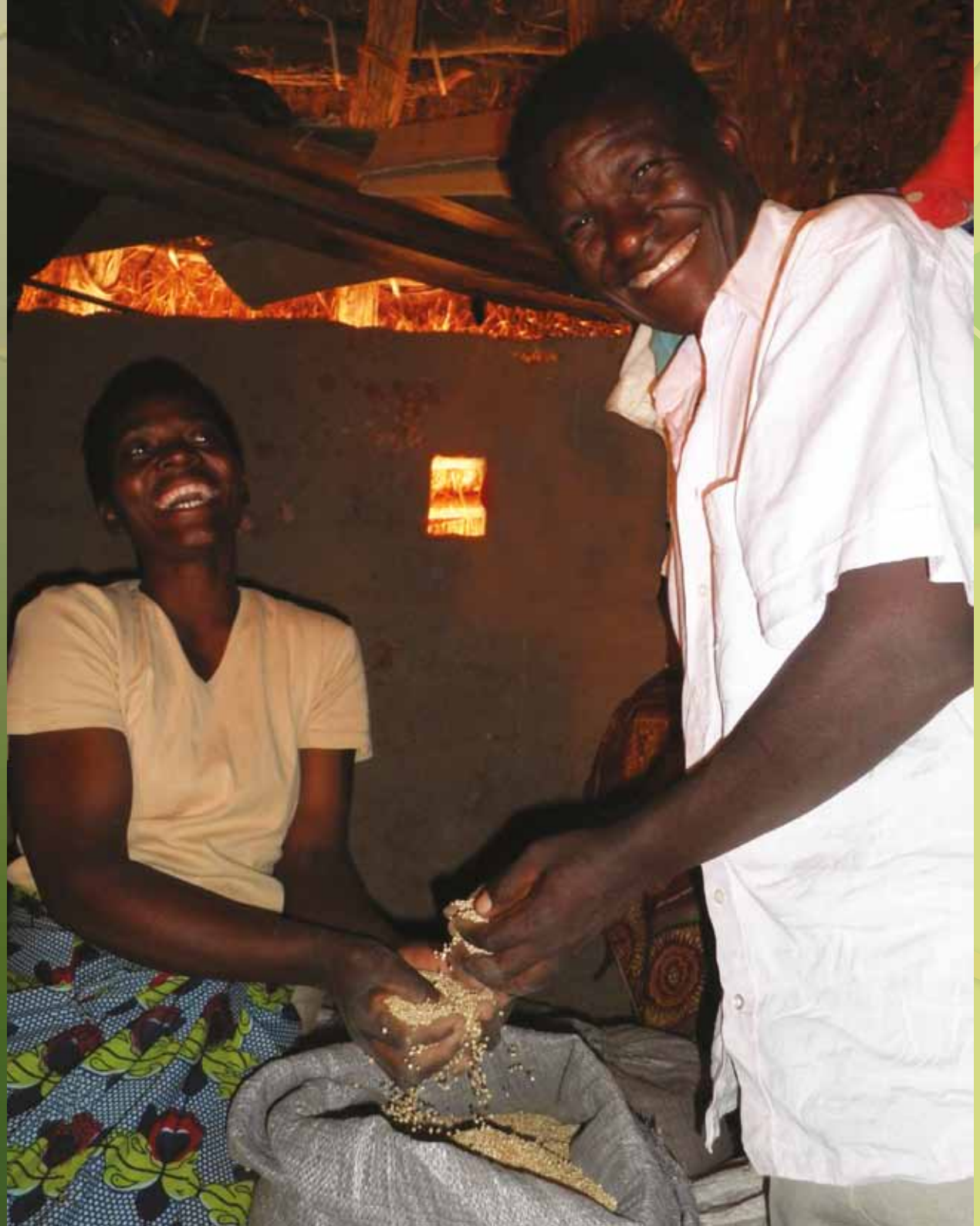

Making things happen

Stories from the field

Series 1

Burkina Faso – Building better lives

DRC – Working wonders with miracle maize

Kenya – Sweet success with sweet potato in Busia

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Making things happen

Stories of how DONATA's innovation platforms are strengthening farming communities across Africa

Series 1

Forum for Agricultural Research in Africa

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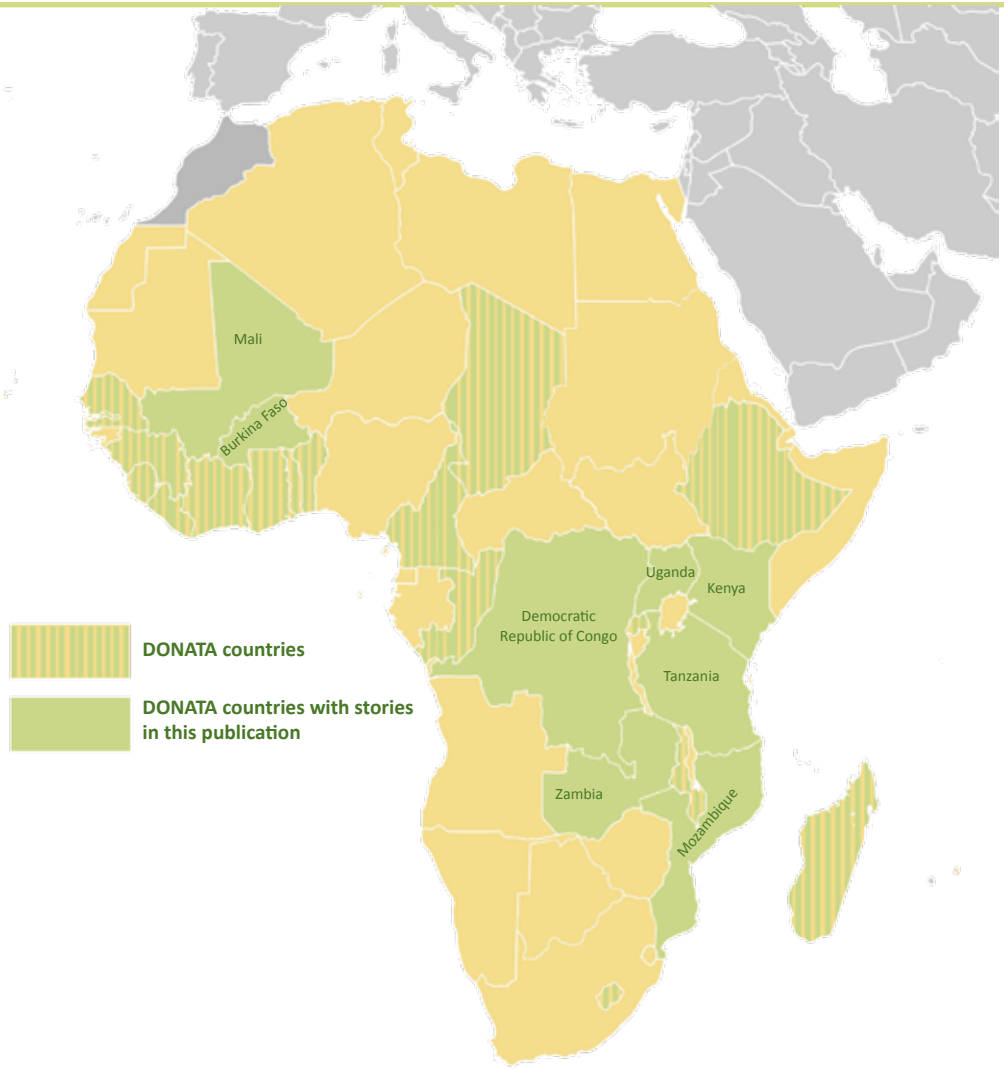

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Message from the Executive Director

FARA, the Forum for Agricultural Research in Africa, is an apex organisation that brings together major stakeholders in agricultural research and development in Africa. We facilitate the dissemination and uptake of technologies and best practices emerging from the agricultural research system. Although we work with an array of stakeholders, our focus is always on the hardworking farmers of Africa, most of whom are women.

Our organisation is far too small to reach out to African farmers directly, so we course our interventions through the sub-regional research organisations (SROs) to the national agricultural research systems (NARS) of individual countries. Working with the SROs and NARS, and supported by our valued development partners, we build innovation platforms for technology adoption (IPTAs), through which technologies that work can be extended to the greatest number of farmers who need them across Africa.

The road to victory starts with the first step Nelson Mandela

One of the projects through which our efforts to extend these technologies are channelled is called Dissemination of New Agricultural Technologies for Africa (DONATA). The stories in this publication show how the DONATA teams in various countries have worked together to improve the livelihoods of African farmers and their families by building and supporting various IPTAs. This is just the first set of stories – we want to publish such stories on a regular basis. This book contains nine stories, we hope that the other 14 countries where DONATA platforms are established will soon be able to share their stories as well.

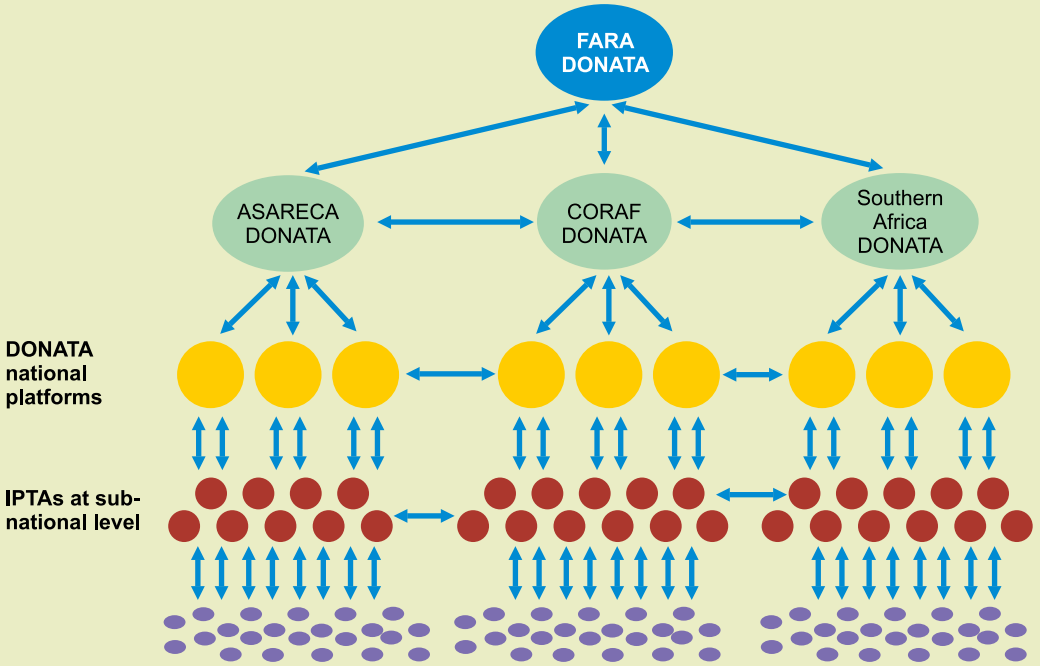
We hesitate to declare success in our endeavours. We hesitate because the word ‘success’ signals that a goal has been reached, that the mountain has been climbed. But as we contemplate the long, hard road in our efforts to achieve sustainable improvements to broad-based agricultural productivity, competitiveness and markets throughout the continent, we know that we have a long way to go.

But as Madiba, the great Nelson Mandela, once said, ‘The road to victory starts with the first step.’ These stories represent a few of these steps. Considered in this light, then, these stories from the field are indeed stories of success.

DONATA and IPTAs – What are they?

DONATA is a continental platform for technology dissemination co-created and co-managed by FARA Secretariat together with the SROs and NARS. Most of its work in the field is conducted through innovation platforms for technology adoption (IPTAs). IPTAs operate at sub-national level and are composed of agricultural research-for-development (ARD) partners, including extension agencies and farming communities. They work on a common commodity and analyse gaps in the commodity value chain to define the IPTA's specific interventions. They follow the concept that effective agricultural technology dissemination – the adoption, use, uptake or commercialisation of existing knowledge – calls for understanding of farming systems through strong linkages and active participation among a range of actors.

IPTAs include researchers, primary producers, extension workers and NGOs, government policy makers, equipment manufacturers and suppliers, traders, processors and others. All of these stakeholders are organised into a coherent platform, with each participant (individual or corporate) contributing to the attainment of its goals.



Burkina Faso

Building better lives

Synergy among stakeholders – the secret of success

The establishment of IPTAs in Burkina Faso started in July 2008 following a workshop organised by the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) in Dakar, Senegal, where flourishing sectors were identified to take advantage of the support provided under this programme. There are two platforms in Burkina Faso, both displaying strong collaborative efforts among the stakeholders.

The first platform deals with maize improvement in the Sissili area, and has nine organisational partners. Regional coordination is provided by the Ministry of Agriculture regional office and by the *Institut national de l'environnement et de recherches agricoles* (INERA) at the national level. Following the expression of wishes and value chain analyses, the stakeholders realised that maize production was on the increase and that there was a need to organise to find marketing opportunities for this growing production. Thus, on 29 April 2010, a second platform for the marketing of maize in the Sissili area was created. The secret of the success of the two platforms is the synergy between them.

There is wide range of stakeholders interested in the development of the maize sector, from both far and near, and they collaborate effectively within the innovation platforms. INERA researchers provide the technology and coordination, working hand-in-hand with *Fédération Nian-Zwé* (FNZ), the umbrella organisation for producers.

Through this platform approach, research enabled a partnership among farmers. Diasso Amidou, the FNZ programme coordinator, explains that the federation's technical and financial partner is DONATA, particularly on issues relating to inputs, seeds and dissemination of agricultural technology. 'DONATA provides support for us in terms of improved seeds, which we make available to the farmers who multiply them,' he adds.

FNZ operates within both IPTAs. In the first, it focuses on technology dissemination. In the second, it looks for marketing avenues for the sale of surplus production. With respect to marketing, the *Société nationale de gestion de stock de sécurité alimentaire* (SONAGES) has become a strategic partner. Zakari Sebgo, marketing manager of SONAGES, confirmed that through the assistance of the DONATA project, FNZ has already made deliveries to SONAGES. 'In 2010, there was a delivery contract of 532 tonnes that we were able to deliver,' he says. 'This year (2011), a contract is in place for the supply of sorghum and millet as part of the security stock. The platform is very active and plays a crucial role because some members are already taking part in the competitive bidding process.'

Sebgo's colleague, Rufin Sindé, manager for stock management and market information systems, declares that working with farmer organisations is rewarding because they are more capable of fulfilling quality standards than the traders. They are a well-organised group and they encourage monitoring through supervision and research.

But SONAGES and wholesalers are not the only stakeholders interested in production. Another group comprises the food processors. One of them, Samssonna Biego, manager of CTRAPA, the *Centrale de transformation de produits agricoles* (agricultural produce processing union), also commends the DONATA approach.

Rufin Sinde (left) and Zakari Sebco (right) at SONAGES headquarters, Sissili

Samssonna Biego, manager, CTRAPA

The producers know that buyers are ready to purchase their crop even before it's harvested. This sets everyone's mind at rest Ouédraogo Narcise, a technician

'Without the collaboration between us,' he says, 'the going would be difficult. The producers complain that the middlemen come to steal their products. We complain that the middlemen increase the prices of raw materials. Why don't we deal directly with each other? It is good that the IPTA allows this. We have high-quality goods and products that satisfy our expectations in terms of nutrition. We requested that the research varieties, especially of maize, be enriched in protein. On this count, we are satisfied!'

Poultry farmers are also members of the platform. Ouédraogo Narcise, a technician in a poultry firm, has been involved with the platform since 2009, establishing a connection between the poultry farmers and cereal producers. The connection is a natural one since almost 70 percent of maize in the area goes into poultry production.

'The producers know,' he says, 'that buyers are ready to purchase their crop even before it's harvested. This sets everyone's mind at rest.'

Among the stakeholders of the platform are microfinance and finance groups. Zongo Basile Xavier, credit officer at ACEFIM (*Agence communautaire pour le financement de la micro entreprise*), indicates that his office identifies and receives requests from producers and grants them loans. For an individual within an association of five farmers, the lowest amount is 150,000 FCFA (USD 315) and the highest is 350,000 FCFA (USD 735). With regard to the association, from the first credit, it can aim at a loan of half a million francs (USD 1050) or even a million francs (USD 2100). These loans are meant for the purchase of agricultural inputs.

'To date, none of the producers who are members of the platform have received a loan,' says Xavier, 'but there are people in the platform who have received the information and as individuals they receive loans.'

Another, not inconsiderable, stakeholder in the platform is the body that represents all the suppliers of inputs grouped under CICB, the *Comité interprofessionnel des céréales de Burkina Faso*. This suppliers' group operates in the area of preservation of cereals and covers all 13 regions of the country. At the local level, CICB is referred to as the Interregional Cereal Committee. The IPTA supports the committee in the area of information on inputs. CICB buys grains and supplies inputs to the producers, including quality fertilizers.

In addition to these stakeholders, there are also transport operators who become involved after harvest. When SONAGES orders a large quantity of maize, transportation is included in the offer. FNZ arranges

Food processing at CTRAPA

Governor of Sissili

with the Association of Transporters for timely delivery of the order to the appropriate location.

The media also make a substantial contribution, supporting the communication of the platforms, as well as the governor of Sissili Province who presides over the platforms. Though the success of the platforms is linked to the collaborative effort among their various members, some stakeholders expect a certain amount of decentralisation so as not to have to wait for an order to come from DONATA in Ouagadougou before consultation meetings are held.

Farmers weigh in

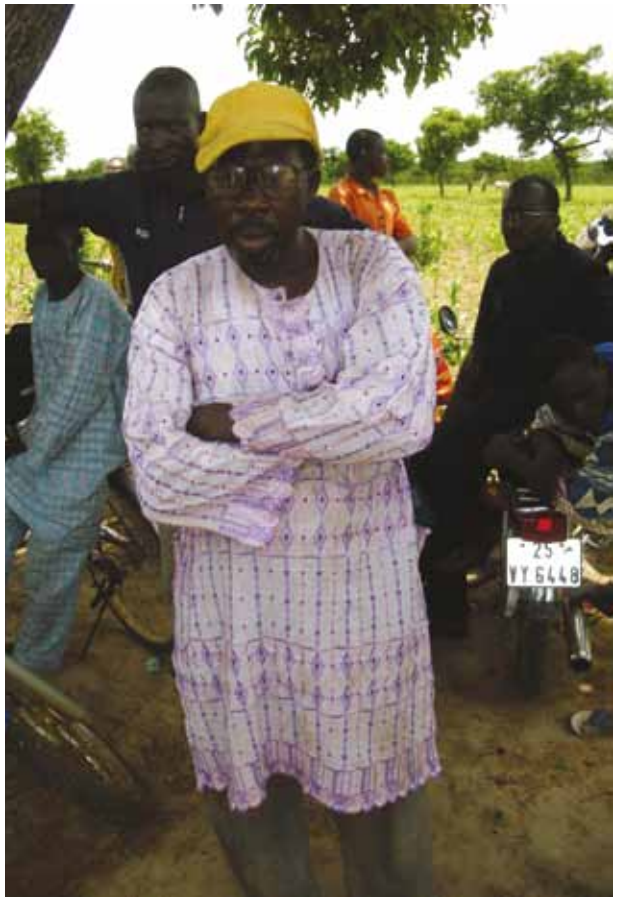
Nignan Issaka, a farmer in Nadion, Sissili Province, a member of FNZ for 10 years, recently joined the platform. 'I used to produce maize, but not on the same land area,' he says. 'I have tried a lot of agricultural practices. Previously, I was not planting in rows, but since becoming a member of the platform, I now understand cultivation techniques relating to maize. I now plant in rows, use fertilizers, plan varietal tests, and do fertilization analyses. I have learned all these things.'

Today, Nignan cultivates 16 hectares: 9 of maize, 2 of groundnuts, 3 of soya bean and 2 of yam. He claims that his membership in the platform has changed his life. 'When I do a comparative analysis, I can see a change. Previously, I used to harvest between 700 kg and 1 tonne of maize per hectare. Currently, I get between 2.5 and 3 tonnes. Part of the production is for consumption by the family and the rest is for sale. I earn between 500 and 600 francs (USD 1.05–1.26) for maize. I am satisfied because I have 15 children in school and I pay their school fees from my farm surplus.'

Nignan works with his neighbours in cooperatives and with the extension workers who support them. They put their products together and send them by tractor to Leo, a town 160 km from Ouagadougou, where the transporters can collect them. But things have been less than rosy. 'I do not have the fertilizer for my maize,' bemoans Nignan. 'Fertilizer is expensive. I need four bags for each hectare and one bag at the market price costs 19,000 francs (USD 40). I cannot mobilise enough money for 9 hectares. None of us can get access to subsidised fertilizer. We go round and round and never get it.'

In spite of these difficulties, Nignan hopes to continue to produce maize now that he understands its cultivation better: 'I implore all producers to become members of the platform to benefit from the training which helps to increase output.'

Nignan Issaka, a progressive farmer in Nadion, Sissili Province, says that membership in the platform has changed his life.



I am not very rich, but I think that in 2 years time, by the grace of God, I will be Napon Ablassé, cereal farmer

Napon Ablassé in his maize field in Worou

Napon Ablassé is a cereal farmer from Worou, a village in Goura Department.

'About 2 years ago I started cultivating maize,' he says. 'I produce one hectare every year. Before then, I grew sorghum and pearl millet, together with beans. Now that I have had a little training through FNZ and the departmental unions, they have given me the *bonofa* (maize) seed. I see that the marketing is much better than when I produced sorghum. With *bonofa*, I can harvest 30 bags of 100 kg per hectare – that's 3 tonnes! As soon as I started producing maize, I saw a big change because the money is paid in a single instalment: I send my goods, I weigh them, I receive my money. Simple! I am not very rich, but I think that in 2 years time, by the grace of God, I will be. But I must admit that I face a lot of difficulties in my maize production. I have a large tract of farmland, but because of the cattle I cannot do much as the rains are not enough. If I had a lot of heavy labour equipment and seed drills, things could be much better. I do not have many wives. I have just two and the sowing is very difficult. Then, the transport problem also crops up as the farm is situated 6 km from the village and it is not always easy to convey the harvested produce.'

FNZ: from subsistence to substance

FNZ existed before the creation of the DONATA platforms for maize production and marketing. But its incorporation into the IPTA helps it in its quest to convert food security into agricultural entrepreneurship.

The federation has only recently changed its name to FNZ, the *Fédération Nian-Zwé*, which means 'hunger is finished' in the Moni language spoken in Sissili. This change signalled an important milestone in agricultural development in Burkina Faso. The results that brought about the name change were the fruit of the federation's relationship with the DONATA platforms.

A mechanism was put in place in 2006 to bring farmers together and assist them in their production. Immediately after harvest, the farmers consolidate their harvest before selling. With the money from the sale of grain, FNZ buys five bags of fertilizer (three bags of NPK and two bags of nitrogen fertilizer) per hectare for each producer, and also provides 5000 francs (USD 10.50) for the producer to transport the fertilizer home. The balance (income from the grain minus the cost of fertilizer and transport) is deposited in a bank account.

With the DONATA project, the emphasis has shifted to technical matters such as variety testing, school farms and window displays. The officer in charge of the federation, Oudou Nadié, says that the platform helped them reach a large number of producers. Today, seeds are in high demand and the use of improved seeds has increased output.

'The strategy we have put in place is quite simple,' says Oudou. 'Last year, we conducted 250 on-farm trials and 25 farmers were trained during each trial. On the sowing day, the officer tasked with assisting the farmer invited the farmer's neighbours and assembled at least 25 farmers around each trial. If one multiplies 25 farmers by 250 trials, that comes to more than 6000 farmers. This year, we reached 300 trials. FNZ has

become regional. We have covered Ziro, which is why we went up to 300 trials.'

According to FNZ officials, it is the trial-host farmers who come for the training, and they in turn return to their farms and train 25 other farmers. Three types of seed are used: medium-maturing, early-maturing and very-early-maturing. Diasso Amidou, FNZ programme coordinator, indicates that the average production is between 2000 and 3000 tonnes per season in Sissili Province. But the most important thing, according to him, is the twofold benefit that the farmers derive.

'The selling price is determined together with the producers during the general assembly by taking into consideration both profits and losses,' says Diasso. 'This is far better for them than selling their produce individually. We are able to provide discounts to the cooperatives, which enables them to buy inputs. The key for sharing is simple: out of a 25-francs (USD 0.05) margin, 10 francs go to the federation, 10 to the producer and 5 to the cooperative.'

But Diasso observes that marketing is not an easy task because the time in storage and the time taken to find a market may be too long for farmers who want to deposit their income immediately.

Madam Minata Coulibaly, the FNZ official in charge of communication, says that the platform has fostered collaboration among the members of the federation as well as other stakeholders. It has also helped to create public awareness about its services and products.

Diasso Amidou, programme coordinator, FNZ

Above and above right: FNZ farmers

Typical FNZ maize farm

Madam Coulibaly Minata, FNZ communication officer

Nignan Abdoulazize, a maize farmer in Nadion, says, 'I joined the federation 5 years ago. I started my training with the varietal tests and fertilization. After progressing to become a seed supplier with one hectare of land, I now have 6 hectares. Earlier, I cultivated sesame, sorghum and pearl millet. I adopted maize because when I did the test I saw that with maize I benefit in terms of output and there is a ready market. I did not abandon the other crops, but I put more emphasis on maize. Getting fertilizer is difficult. In the past, I had to use cotton production to be able to get fertilizer, but with maize production I am able to sell surplus to buy fertilizer in order to produce. And through the platform, I obtain fertilizer for producing maize. FNZ makes bulk orders and subsidised fertilizer is available. This year (2011), a bag of nitrogen fertilizer was given to us at 12,500 francs (USD 26) and NPK at 13,500 francs (USD 28). I got foundation seed from FNZ in collaboration with INERA. The seed cost me 1500 francs (USD 3) per kilogram.

'I feel a great change in what I am doing because of this seed. I earn a lot of money and I am able to supply all the other farmers. I have also observed that there is a greater involvement of my family members in the management of my plantation, which was previously not the case. Now, at the end of every season, we sit down and take stock of the situation and the family is highly motivated.

'As a result of the training received, I know how to demarcate my farm, the labour techniques, the labour intensity, the use of fertilizers, seed production techniques and technical monitoring. It is the federation that provided us with the assistance in selling our harvested produce. As far as transportation is concerned, we find our own means.

'The DONATA project has not only helped me, but the entire population of Sissili as well. I do not have any problem feeding my family. They are happy and there is understanding within the family.

'Previously, when someone talked to me about bank accounts, I said that they were only meant for state functionaries or wealthy people. But today I also have an account at the Caisse Populaire because of maize production. After selling my produce, I save part of my earnings. If there is any problem in the family, I make a withdrawal to solve the problem.

'I used to cultivate one hectare annually. After paying my loans, I would end up with about 40,000 francs (USD 84). This year, I cultivated 6 hectares and have 2.5 million francs (USD 5243). I will continue producing maize through the DONATA project. I want the FNZ-DONATA partnership to continue. But if one day this partnership is no longer operational, I can still depend on myself because they have taught me something that is valuable. And, in collaboration with other stakeholders, I will be in a position to assist others. My wish is to obtain agricultural equipment like a seed drill and a tractor, because cultivating 6 hectares is not at all an easy task.'

Microbiologist Prof Gnissa Konaté was director of INERA for 5 years. Now, as Minister of Scientific Research and Innovation, his new functions give him a twofold interest for this project.

An FNZ enumerator in the field

'When I read about the project at the beginning, I heaved a sigh of relief even before its implementation,' he says. 'Why? Well, I asked myself how could I come to terms with the fact that people who claim they are working for agricultural development cannot come together as a group to work. DONATA came to the rescue and put all the stakeholders together to resolve problems.'

His second interest, he says, is personal. Apart from cotton, he had never seen any technological package in Burkina Faso that had been disseminated on such a large scale.

Another issue of concern was that people say that the research world often claims to have achieved some results, but the impact on economic development is never seen. 'Through the DONATA approach, there is definitely going to be an impact on development,' he declares. 'I said to myself that this is an opportunity to demonstrate to the sceptics that scientific research is able to impact on economic and social development. DONATA responded to the frustrations I had.'

Looking to the future, Konaté says, 'I believe that in 5 or 10 years everyone will see clearly what this initiative has helped to establish in Burkina Faso in terms of the impact of research on development. DONATA is nothing less than a tool for people to become wealthy. If DONATA enables this value chain to be organised – as it is doing by disseminating technology through the collaboration of all stakeholders – we are going to have dynamic industries, because all those who are stakeholders from production to processing or consumption will be putting their concerns on the table and they will be factored into the scheme.

'I always say that our problem is neither lack of competence nor lack of financial resources, but one of institutional convergence. As long as we are unable to come together to break the barriers in government departments and to appreciate the fact that we are working for the same cause, things will continue to be at a standstill. What the DONATA project seeks to do is to bring all agricultural development stakeholders together to succeed in disseminating technologies so that they will impact on development.

Professor Gnissa Konaté in his office

'I am convinced about this approach. I will do all that is humanly possible because this vision corresponds to mine. I will act as the intermediary on the basis of the results that will be obtained. In short, we are satisfied with the results of the DONATA project!'

François Lompo is a soil scientist and director of INERA. He, too, is confident with the DONATA approach.

'It is the concrete manifestation of the new approach that we call IAR4D – integrated agricultural research for development. This new approach helps researchers tailor their findings to the actual needs of producers. We are revisiting our strategic plan in terms of approach, methodology, agricultural development and contribution of research. We have adopted this platform approach, which has turned out to be a very important mechanism in terms of renewal and matching research with the actual needs of stakeholders. The platform concept is being adopted by the national agricultural extension system, which is incorporating its tools and methods so as to popularise and disseminate technologies.'

Considering constraints that affect the implementation of the IPTAs, he says, 'One must think about the existence of a market. That is, knowing that the product will be purchased. There must be a link between increase in output and an ever-growing market opportunity. Thus, there is the need for better information flow, better contact among the food processors, producers and traders. The farmer must be confident that his product will be bought before he launches himself into producing it. The major challenges consist of the changing levels, extending it to the national level.'

What do the INERA researchers have to say?

Many researchers at INERA are involved in the implementation and monitoring of the DONATA project. When they were asked about the collaboration that existed between research and the other components of the platforms, and the impact of this collaboration on their mode of work, they provided the following answers.

It is a positive development. We have learned to open up a lot to the external world, to rural communities and to other stakeholders and partners.

Sanfo Ramané, Head of Research and Projects Department

Emmanuel Siambo

Extension officers on the ground have found this platform to be an exciting mechanism compared to other available methods such as family farms and farmer field schools, because this mechanism creates a linkage among all the stakeholders – the political establishment, the marketing professionals, the consumers. The platform approach helps to promote the new national extension system.

Emmanuel Siambo, Head of Good Practices/Research Development Department

The fact that DONATA is working with all the partners widens our field of operation. Locations that we could not reach out to are now covered by DONATA – the gaps have been filled.

Jean-Baptiste Taonda, head of the Liaison-Research Development Department of INERA and the DONATA focal person in Burkina Faso, has this to say:

'FNZ mobilised almost the entire province. The project benefits all its members. More than 40 percent of the province is under the influence of technology. The producers' organisation demonstrates that there is a paradigm shift in the area of intervention.'

When asked about constraints, he says, 'I will not talk about constraints, but rather about conditionality for the smooth functioning of the platforms. The first is to ensure consistency in the collaborative effort so that conflicts of interest are obviated. FNZ organised itself to consolidate cereals and sell in bulk. Some individual traders would have preferred to make direct on-farm purchases from the producers.

Jean-Baptiste Taonda

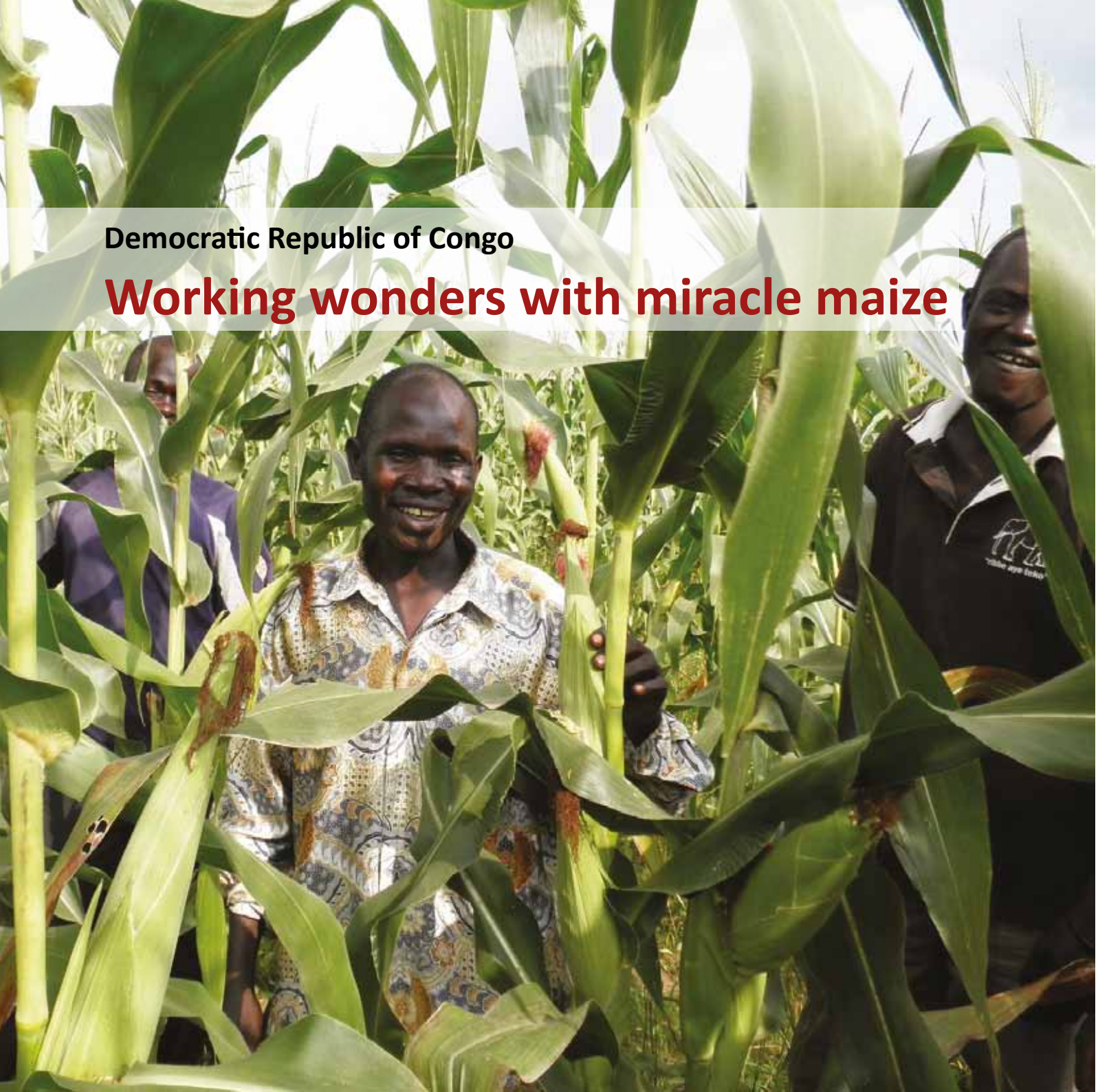
'We want to ensure that everything works out well for everyone, that the interests of all stakeholders – however numerous they may be – are taken into consideration right from the planning stage. Joint monitoring of activities on the ground by stakeholders is also needed. A minimal amount of resources is required for this.'

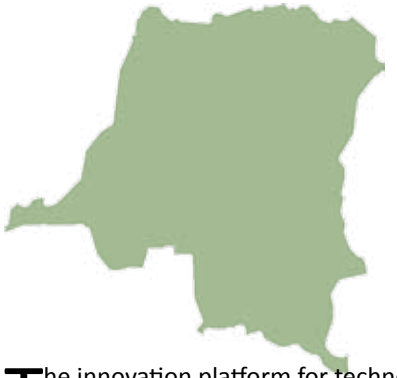
Extension officers on the ground have found this platform to be an exciting mechanism compared to other available methods such as family farms and farmer field schools

Emmanuel Siambo

Democratic Republic of Congo

Working wonders with miracle maize





The innovation platform for technology adoption (IPTA) in the Democratic Republic of Congo (DRC) has created a strong link between agriculture and health. Research products are being used to simultaneously fight malnutrition and improve livestock production. Below are some stories gathered from partners who have come to appreciate the qualities of quality protein maize (QPM) through membership in IPTAs.

Jean Pierre Mulumba is the manager of Saint-Sauveur Nutrition Centre (CNSS) at Luputa in central DRC. According to him, QPM is responsible for saving no less than 567 children between 0 and 12 years of age who were suffering from malnutrition. QPM also helped increase mothers' breast milk production while helping them to recover from malnutrition. When fed to pregnant women, adds Mulumba, QPM helped them give birth to fast-growing babies. Moreover, it is more cost-effective than soya.

Through the IPTAs, QPM use spread to the elderly, improving their vitality. For instance, 80-year-old Albert Tshibangu, who had difficulty walking, was able to throw away his cane after consuming QPM.

These twin boys completely recovered from malnutrition after consuming QPM

QPM enabled Albert Tshibangu to throw away his cane.

The platform further explored the use of QPM to newborn babies. Orphan babies were breastfed by other lactating mothers, who consumed QPM expressly for this purpose. Here are some specific examples:

- Esther Muamba, a widow, breastfed an orphaned baby in addition to her own baby.
- Kabamba Alphonsine was able to breastfeed orphaned twins in addition to her own baby.
- Ndaya Kazadi breastfed a 7-month-old orphaned baby in addition to her own baby.
- Katolo Kalubi successfully breastfed a 6-day-old orphaned baby in addition to her own baby.

And it is not just surrogate mothers, as the following examples illustrate.

- Musau Mamy gave birth to quadruplets. When one of them was breastfed, the other three could not get enough milk from their mother and they fell into a state of listlessness. When the mother was given QPM, she produced enough breast milk for her quadruplets, three of whom survived and are healthy today.
- Jeanne Mua Mbuyi Mbombo produced no breast milk after giving birth. She was given a peanut diet, which was not successful. However, when her diet was switched to QPM, she was able to breastfeed her twins successfully. They both survived.
- Masangu Kaja: 'My small child, Mbombo, reached a hopeless stage of malnutrition despite the efforts of Gandajika hospital. When she was given QPM from the Ministry of Agriculture, she recovered quickly.'
- Jeannie Nseya usually has problems of breast milk production after giving birth. She needs to bottle-feed her babies, but this is costly. When she was given a diet of QPM, she produced sufficient breast milk and no longer needed to rely on bottle feeding, saving her USD 72 a month.

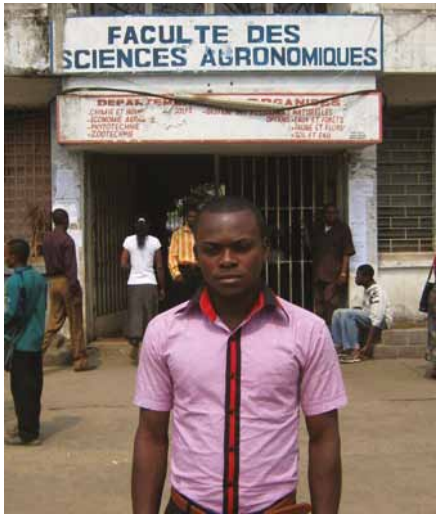
Samy Ntumba from Mpiana Basangana village says, 'Through IPTAs, we have been able to explore various uses and benefits of QPM for the past 2 years. Using QPM increased my maize production from the field and allowed me to explore its use beyond human food. We tested use of QPM as pig feed. It resulted in increased piglet production, giving us extra income. Previously, we used soya beans to treat pig malnutrition, but soya beans are very expensive. QPM costs less and produces faster results. Through the sale of QPM seeds and grains, I was able to pay for my son's studies at Kinshasa University and my little brother's studies at the Institut supérieur d'études agronomiques at Gandajika.'

IPTAs also facilitate value addition activities for women. A spokesperson for a women's group processing QPM in Luputa says, 'We were taught to bake bread and cakes using QPM flour. This has created additional income and allowed us to extend credit to those interested. It also enabled us to build an office and a multipurpose room to process the QPM and undertake other revenue-generating activities.'

Martin Kapanda, president of the Mweneditu IPTA, says, 'We receive the seeds from research and make them available to agricultural multipliers who multiply, resell or make them available to farmers. All social classes are represented on the platform. We meet monthly to assess progress. We have succeeded because the multiplication and processing activities are going on all the time, whatever the season. Through the innovation platforms, more organisations have learned how to process QPM and today these products are sold on the

market as wine, biscuits and bread. People are very happy because some have made money through better knowledge and activities around QPM.'

'The IPTA in Mweneditu began with only six NGOs,' Kapanda continues. 'In the second season, we worked with eight NGOs and in the third with 11 NGOs. Each NGO has at least 1000 farmer partners. We already have over 11,000 farmers under our supervision. In addition to these, we should not ignore the various requests that will allow us to go further inside the country. The seeds are insufficient and we would like to ask INERA (DRC's *Institut national pour l'étude et la recherche agronomique*) for help as there is a high demand for seeds.'



Samy's son Emmanuel is the first person in his village to attend university. His choice of study? Agronomy. This son of the soil will not desert it.

Field visit in Mweneditu

Samy with his prize pig

Greater interaction among farmers, extension workers and researchers facilitated better understanding of farmers' complex challenges and finding solutions together, explains Kapanda.

'Solutions are developed together with the farmers. Farmers do not have the means to produce big harvests. But with more targeted and timely advice and support, they can do a lot. Some need fertilizer so that they can produce more. At the processing stage, there are shortages of some products such as SITRIC, a preservative used in wine making. We have sent requests for it everywhere, but without result. Farmers need equipment, fertilizer and agricultural machinery. Tractors are available, but farmers can only hire them when they have money. They coordinate their activities so as to avail of the technology. Within the platform, diverse groups are able to work together towards a common goal. It has been a challenge to set up this platform, but now that we have done so members see the advantage. We need to continue our support towards a more independent platform run by the community itself.'

The IPTAs in DRC are gaining strength and increasing their ability to encourage both agribusiness and the health sector. The linkage between food and nutrition is now better understood by the policy makers on whose decisions the community depends to improve its working environment.

Kenya

Sweet success with sweet potato in Busia

'From grass and thatch to red brick and zinc roof' is how Patrick Makokha, farmer and secretary of the Siwongo Drainage and Irrigation Self Help Group sums up what one can do with the rich pickings from growing and selling sweet potatoes.

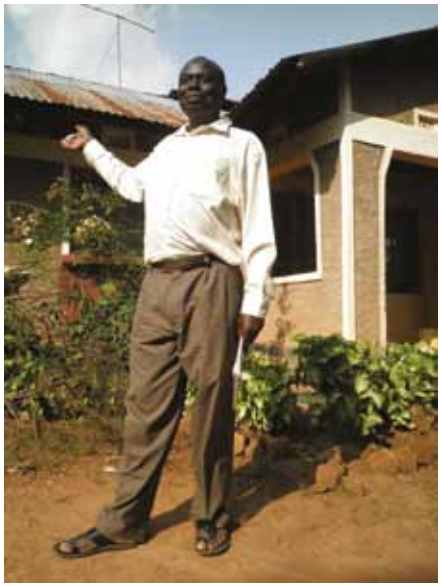
But Makokha's sweet potato success is not from just any sweet potato. Makokha is one of 2000 farmers in Kenya's Busia District growing and adding value to the orange-fleshed sweet potato (OFSP) promoted by the Rural Energy and Food Security Organization (REFSO).

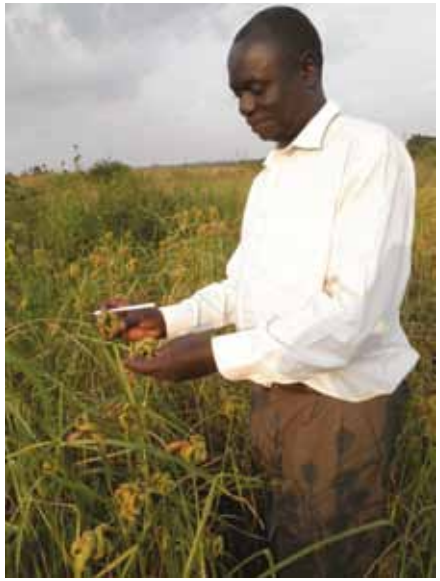
REFSO is one of four non-governmental organisations (NGOs) that are members of the Busia IPTA in Western Province under the Regional Agricultural Information and Learning System (RAILS) and DONATA projects supported by FARA.

Makokha switched from growing maize to OFSP, which was introduced by the Kenya Agriculture Research Institute (KARI). OFSP is rich in vitamin A and has gained acceptance for its nutritional value and as an income earner. OFSP has enabled farmers like Makokha put food on the table and at the same time boost

Left: OFSP, the miracle crop

I have seven children and three have been taught how to produce sweet potato Patrick Makokha





Patrick Makokha outside his zinc-roofed house (left); and with his finger millet crop (right)

their income from selling roots and vines, which sell for one Kenyan shilling each (a mere 1 US cent!).

'Growing and selling OFSP vines has become my source of livelihood,' says Makokha. 'It has helped me in educating my children and putting up a house for them. I have even bought a second hand pickup to collect sweet potatoes from other farmers and to distribute the vines. It is helping me survive and is now my major income-generating project.'

With seven acres (2.8 ha) under OFSP, Makokha makes roughly 30,000 Kenyan shillings (USD 300) a month from selling sweet potato roots and 20,000 shillings (USD 200) a month from selling vines. Makokha complements income from OFSP by growing finger millet and quality protein maize (QPM) on his plot.

'Sweet potato used to be a woman's crop, but now I am doing large-scale production,' explains Makokha. 'I have seven children and three have been taught how to produce sweet potato. My neighbours have also taken to growing OFSP after seeing that there is money to be made from it.'

Promoting OFSP in Busia brought relief to farmers who were facing food challenges when mosaic virus hit their maize crop and yields were low. Members of the Siwongo Drainage and Irrigation Self Help Group were given four OFSP varieties – Keputeni, Kakamega 123, Mugande and Pumpkin. After an on-farm trial, the group chose to plant Kakamega, which they multiplied and which produced a bumper crop that the local market could not absorb. The International Potato Centre (CIP) then helped them secure a market for sweet potato chips in Nairobi.

'Rather than leaving sweet potatoes to rot, we thought of processing them into fried chips even though we had no knowledge of making chips then,' says Makokha. 'A half tonne of our chips was rejected by the market because they were of poor quality.'

After KARI and REFSO helped train members of the Siwongo group in making better-quality chips, their market grew from 200 kg of sweet potato chips a month to 500 kg. However, at that time the group had challenges with the SPK004 variety because it had low carotene content after drying. It was then that the DONATA project introduced three OFSP varieties – Ejomula, Kabode and Vitaa – all of which had high carotene content. The group successfully grew and

Weeding is an important activity in growing sweet potatoes

Healthy vines are vital for a good crop

multiplied these varieties. The big remaining problem is storage.

REFSO has helped in strengthening the capacity of farmers in terms of OFSP seed production techniques, information sharing, value addition and marketing.

'OFSP varieties were promoted for vitamin A, which is critical for nutrition at household level, and to make available planting materials for that particular OFSP variety so that farmers can access them,' says Michael Odongo, REFSO Programmes Coordinator.

Vitamin A was available from the sweet potatoes that farmers were already growing, but REFSO promoted OFSP and intensified production to boost nutrition and incomes.

'Many farmers have increased their area of OFSP because of the available market. Each season you can see the increases in sales for each farmer,' says Odongo. 'We have encouraged value addition because we believe that we need to enhance the consumption of OFSP so that sweet potatoes are not just boiled and eaten. A lot of value is added with crackers, chips and chapatis. As a development facilitator, I feel happy that we have provided an opportunity for income generation and an alternative source of livelihood for the farmers.'

Michael Odongo

Odongo says that REFSO would like to see the establishment of processing units located strategically within communities and an improved linkage with market outlets through collaboration with partners such as Farm Concern International.

A thatch hut in Makokha's compound that served as the group's first storage facility did not meet ideal hygiene standards. DONATA helped the group build a more hygienic storage house and also contributed a manual chipping machine and grain-washing machine.

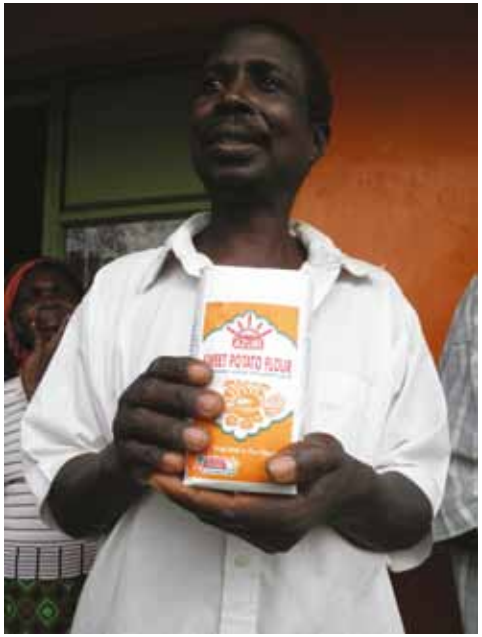
Reacting to growing demand for OFSP roots and chips in upmarket supermarkets and grocery stores in Nairobi, the Siwongo group sells 2 tonnes of OFSP chips in the Azuri market alone every month, while the Kirinyaga market wants one tonne every fortnight. Orders are outstripping supply.

Makokha said the group was working to contract other farmers outside its 55 members to grow OFSP on a large scale from vines provided by the group. At the same time, the group is exploring other value-addition strategies. Already OFSP peelings have been used to feed fish and pigs.

'Currently we are making OFSP flour for the local market in our district and for the market in Nairobi,' says Makokha. 'We pack flour for local consumption into 500 gram packets and bulk pack the flour into sacks for other markets because the distributors repack them into smaller packets.'

A 500 gram packet of OFSP flour sells for 50 Kenyan shillings (USD 4.50) in the village, but will fetch 95 shillings (USD 8.64) in Nairobi. OFSP flour is a versatile ingredient for blending with wheat flour in baking, for making porridge and for thickening soups. There are plans to develop a one-stop shop at the Siwongo

Henry Ochieno, farmer and production officer



The OFSP project is good for the community because it helps them prosper Florence Naliaka, farmer

OFSP Processing Unit so that it can mill, package and distribute OFSP products. Currently, the group grows the roots, makes chips, dries them, and sends them to a miller who turns them into flour and distributes them under the Azuri brand in Nairobi. If the group can produce the flour at its processing unit, it will maximise income from the project.

Another member of the Siwongo group, Henry Ochieno, who is also in charge of production, was the first farmer in the group to successfully multiply two varieties of OFSP vines on a small piece of land and sell them to other members.

Evelyn Auma Oduori, a successful farmer

Florence Naliaka

'I used to plant sorghum, cassava and millet, but compared to sweet potatoes, OFSP has given me a higher income,' says Ochieno. 'I bought a cow, constructed a house, and bought clothing from the money I made from the OFSP vines. Even my children are healthy and have enough to eat.'

Evelyn Auma Oduori, another farmer and member of the Siwongo group, also used proceeds from selling sweet potatoes to buy a cow, build a house and to pay school fees for her children up to secondary level.

'The OFSP project is good for the community because it helps them prosper,' says Florence Naliaka, another farmer. 'Having been a member of the group for the last 5 years, I have been able to pay school fees for my children, buy clothing, build my house and spend on household goods.'

Kenya's Ministry of Agriculture realised that sweet potatoes had been grown in the past, but were no longer being promoted as farmers focused on cereals. This trend led toward food insecurity.

'The ministry created awareness among farmers, encouraging them to go back to growing cassava, sweet potatoes and the like, and a policy has been developed on roots and tubers,' says Kennedy Otieno, District Crops Development Officer of the Ministry of Agriculture. 'The policy is going to regularise a number of issues on seed production. These farmers need training because those who were initially relying on maize are now changing their methods of farming towards roots and tubers, particularly sweet potatoes.'

Challenges

Having overcome the challenge of finding a market for its products, the problem of quality planting material

was addressed with the help of the DONATA project, which brought in KARI's expertise. KARI provided conventional and tissue culture planting material, which farmers multiplied in their multiplication sites.

When KARI started the selection of sweet potato varieties for farmers in Kenya, its breeding programmes did not focus on OFSP, according to researcher, Phillip Ndolo.

Working with CIP, KARI looked for varieties with higher carotene content and is currently promoting Vitaa, Kabode and Ejomula. Vitaa and Kabode are red-skinned and orange-fleshed, they have high grain matter and are acceptable to farmers. Moreover, the two varieties are in high demand on the market.

'In the market once there is the red-skin variety, customers will go for that variety and then go to others later on,' says Ndolo. 'There is also a price difference because the market will buy the red-skin varieties and leave others, which will be sold at a throwaway price.'

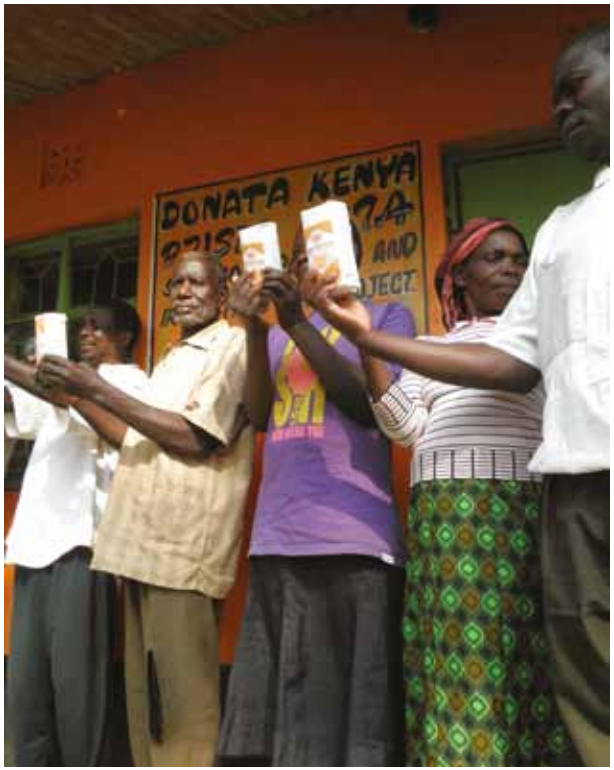
Researchers are now working on releasing early-maturing OFSP varieties so that farmers can take advantage of the short rains and get a crop within 3 months.

Sweet potatoes are perishable, especially when they have been made into chips. They need to be dried within 8 hours and should not remain overnight as they quickly mould. A solar drier would be appropriate and hygienic for the Siwongo group.

Lessons learnt

'Farmers have learned that coming together and having different people with different knowledge can really support a process,' Makokha says. 'By using the knowledge of different partners we can go a long way. For example, without KARI we would not have grown OFSP or known about pests that attack the crop, but now we have been able to learn. It is good.'

We did it!



Future prospects

The Siwongo Drainage and Irrigation Self Help Group has grand ambitions of registering a limited company and produce OFSP on a large scale to be able to distribute its own products and commercialise them to gain a large consumer base. Discussions are being held with the Kenya Horticulture Project, which is working with the IPTA in Busia and focusing on the export markets for OFSP in Europe. The group has a potential order for 80 tonnes of fresh OFSP roots for the European market every week starting in October 2011.

Farmers have learned that coming together and having different people with different knowledge can really support a process Patrick Makokha, farmer

Mali

Food security is our motto

The DONATA project officially started in Mali in 2007 and the fieldwork in 2008/09. By mid-2011, four innovation platforms for technology adoption (IPTAs) had been established.

Four IPTAs

The first platform, which focuses on maize production, was set up in three regions – Kayes, Kiroukoro and Sikasso. Work in Kiroukoro is split between two prefectures, Sanankoroba and Ouelessebougou. The platform is made up of researchers, producers, extension workers, transporters, processors, the two biggest maize mills in Mali (Grands Moulins and Moulin du Sahel), news reporters, local area decision makers such as mayors – and a very important private company, Faso Kaba, which supplies seeds and other agricultural inputs. The platform has more than 500 producers in Kiroukoro and Sikasso: 150 in Sanankoroba, 180 in Ouelessebougou, and 200 in Sikasso (most of which are in the Bougouni area). In Kayes region, there are more than 200 members, mainly in the prefecture of Kita area.

Fields of farmer members of Ben-ba Association

The Ben-ba Association – ben-ba means 'good understanding' – existed before the DONATA project began.

Membership is increasing every year. Sannakoroba had 120 members contributing to a yield increase in the areas of operation in 2010; 30 were added in 2011. Maize yield among non-members is between 1.5 and 1.8 tonnes per hectare, but for platform members the average yield is between 3.5 and 4 t/ha.

Like the first platform, the second platform has maize seed production as its entry point. This platform was established in partnership with a private seed company Faso Kaba for the supply of seeds. (Appropriately, *faso kaba* means 'maize of the homeland' in Bambara, the local language.) Good seeds give 35–40 percent more yield than farm-saved grain. Faso Kaba works with three seed cooperatives, all of which have been trained in the production of certified quality seeds. The introduction of certified seeds is boosting production in these areas.

The third platform has irrigated maize as its entry point. It is located in northern Mali in the Timbuktu–Gao area. The average yield in this area was 0.6 t/ha, but since the IPTA was established yield has increased to 4.6 t/ha.

The fourth platform associates maize with jatropha. This platform operates in three areas – Koulikoro, Kita and Ouélessebougou. The objective is to improve the income of the 2000 participating farmers.

These four platforms were established through the facilitation of research and extension. All members are engaged and motivated to ensure success. Each platform discusses and decides on areas where gaps exist, such as seed production and the need to increase yield to feed the community. Transporters are engaged as needed, especially when inputs are required in specific areas. The outcomes of the platform are communicated across the country through Mali's office of radio and television.

Maize production in the south

The Ben-ba Association – *ben-ba* means 'good understanding' – existed before the DONATA project began. It supports producers with money to buy agricultural inputs, and its membership in the platform has made a positive impact on producers. At first, the association was made up of just a few producers, but with time it has expanded and has been achieving impressive results. The association serves three prefectures – Bougoula, Dialakoroba and Sanankoroba.

The first IPTA conducts its field experiments in Sanankoroba prefecture, about 30 km south of Bamako.

Through the IPTA, Ben-ba helped 24 producers by giving them agricultural inputs to cultivate 24 ha in 2009. It has also helped more than 100 other producers to maintain 124 ha in 2010 across the three prefectures (covering 60 villages). In 2011, more farmers were helped and the area expanded to 150 ha.

The IPTAs connect producers with other actors, creating synergy. Under the leadership of Coulibaly N'Tji, the DONATA focal person, the platform purchases seeds from Faso Kaba at 400 FCFA (USD 0.83) per kilogram and makes them available to producers, who repay the platform with grain after harvest at a rate of 620 kg per hectare. The inflow of this grain has facilitated

Ben-ba cereal banks with stocks of maize

the creation of cereal banks in each district. By mid-2011, there were over 76 tonnes of maize in the three communal warehouses. The stock is sold at affordable prices to populations during the lean season, enabling people to avoid the effects of speculation and travelling long distances to shops.

In June 2011, Ben-ba distributed 2480 kg of certified seeds among producers in the three districts and purchased 620 bags of fertilizer. Field monitoring was conducted by Ben-ba committee members to estimate the levels of production achieved by those receiving seed. On average, each hectare produced 2200 kg – a total of 272 tonnes for the 124 ha. The activity has helped producers increase production and ensured food self-sufficiency in the area. According to Ben-ba's president, Abdoulaye Sériba Traoré, maize production in 2010 helped feed 653 people throughout the year at the rate of three bags per person.

'The DONATA project does not have enough funds to supply all farmers with inputs,' states N'Tji, 'but the mechanism in place with Ben-ba makes it possible to get new members to join the project every year. We see good collaboration between the company and producers.'

Mode of operation

Since farmers do not have enough money to buy inputs, the association purchases seeds from Faso Kaba at 400 FCFA (USD 0.83) per kilogram and makes them available to producers. Souleymane Konaté, coordinator of Ben-ba in Sinankoroba, explains how the Association helps farmers obtain fertilizer.

'If a farmer does not go through our association, she or he will have to pay between 15,000 and 17,500 francs (USD 31–36) for a bag of fertilizer. We buy it at 12,500 francs (USD 26) and sell it to farmers at the same price. A farmer who cultivates one hectare is entitled to five bags of fertilizer – three bags of urea and two bags of compound fertilizer – for a total of 77,550 francs (USD 161). Ben-ba members thus benefit from the bulk buying by the association. We can also buy the grains at 125 francs (USD 0.26) per kilogram. After transport and field monitoring, all expenses incurred are calculated on a per-hectare basis and the selling price is set. We are not interested in making profit – we want to ensure food security. The maize purchased at 125 francs is sold at 150 francs (USD 0.31). Through this mechanism, the farmers are double winners: not only do they produce good quantities of maize thanks to technical assistance, but they can sell the grains at 150 francs a kilogram.'

Challenges continue and will be met with group solutions. Despite its performance, the association still struggles to access fertilizers, even though it has enough money to buy them. The fertilizer often

Abdoulaye Sériba Traoré is the president of the Ben-ba Association. Before the beginning of the DONATA project, he was working only one hectare of maize; he is currently working 3 ha. 'I used to sow in bulk, there were no lines,' he says. 'But I followed the advice of Mr N'Tji, the DONATA focal person, and started sowing in lines marked with ropes. I was not getting more than six to ten 100-kg bags before, but now I can get 30 to 40 bags. Other people get up to 50 bags. Everybody gets at least 20 bags. We can't say that things have not changed!'

Motivated by these results, Traoré says, 'I have decided to produce 60 bags per hectare this year. The price of maize has changed. A kilogram of maize used to sell for between 75 and 100 CFA (USD 0.16–0.21), but now it sells between 100 and 150 CFA (USD 0.21–0.31). This will help me store up enough resources.'

The farmers do not complain. As one of them says, 'I feed my family better now. The change has begun! We are satisfied with the project.' Traoré adds that he hopes that the project will continue and help producers and farmer cooperatives acquire shelling machines, tractors and oxen.

Abdoulaye Seriba Traoré in his field at Koulikoro, Kati cercle, sub-prefecture of Sanankoroba

arrives late and, according to producers, there are too many steps to go through to access it. Moreover, again according to producers, there are no shelling machines and it is difficult to transport grain from the fields to the shops because the producers always need to negotiate with drivers who generate an additional expense.

Through the IPTA, the Ben-ba Association is becoming an increasingly useful organisation – helping to improve the living conditions in the three districts it covers.

Ben-ba Association members working in their maize field

A vital role in technology transfer

For Bino Témé, director of Mali's *Institut d'économie rurale* (IER), the DONATA project fills a vital gap in the country that IER cannot.

'The DONATA project focuses on technology dissemination. One of the weaknesses of our national research system is technology dissemination. We have researchers who know how to conduct research, but their achievements do not always reach the level of producers, fields and factories. The adoption of innovations is low. This requires a change in methodology and strategy – the DONATA project has strengthened our ability to make these changes. Since the project was established, technology dissemination has been strengthened in both rainfed and irrigated areas where we are trying to introduce maize cultivation. The DONATA project is doing a good job,' he says.

The collaboration inherent in the philosophy of the IPTAs is important to Témé. 'We have a lot of varieties, but we need support to disseminate them,' he says. 'We need support at seed level, we also need advice. Collaboration is needed from an array of actors, each playing his or her role. We need receptive people and those who use the technologies need to be trained. We need extension, production and dissemination – the whole value chain. It is good to work together within the platform on an issue identified as a constraint. Working together helps the users to make progress and improve their incomes. It also improves the quality of research work. All the actors develop synergies, and our production has not dropped since the beginning of the project. Rather, maize production has been increasing considerably. We think that we are on the right track.'

Far from the cynicism so often seen with respect to project work, Témé is refreshingly upbeat, 'Although there are constraints to all projects, there are none specific to DONATA. The overall problem of DONATA and all the projects is how to continue the activities that have been started.'

Faso Kaba: a strategic partner

The role of the Faso Kaba seed company is to produce and distribute fertilizers, seeds, small tools and other inputs. This is an important part of achieving the project's results.

Faso Kaba plays its role by contracting with IER for the supply of basic seeds at the beginning of each year. It distributes these to its network of seed producers. Plots are then established, and the names of farmers, the surface area sown, and the variety to be produced are passed to the national department of agriculture, which maintains quality control by conducting field inspections. When the department gives its certificate, Faso Kaba contacts the producers to collect the certified

seeds, which are cleaned and packaged into bags weighing between 1 and 20 kg.

The DONATA project then informs the seed company of the needs of the farmers and provides the farmers with extension services. Faso Kaba supplies the farmers with the inputs. After harvest, farmers either sell their products to Faso Kaba or process and sell them directly in the village. There are also agro-dealers to whom Faso Kaba gives seeds for distribution.

According to Faso Kaba, Sotubaka is the preferred variety because it can yield up to 6 t/ha. It is also the most valued delicacy from a culinary point of view, followed by Dembanyuman. People who sell roasted corn are more interested in a third variety, Niéléni, which is very sweet.

A definite impact

Mme Maïmouna Coulibaly, founder and owner of Faso Kaba, says, 'I started with one tonne of cereals. We presently deal with more than 650 tonnes of maize, sorghum and rice seed. With DONATA, there is market access for cereal producers. This helps improve our sales and suits everybody. When producers have a market for their products, it encourages them to buy seeds. There has been an increase in the adoption of improved seed, which has boosted productivity and increased sales. The farmers send their children to school, they build houses. Impact has been made. The partnership has gone perfectly and we would even like an extension of the project.'

Sign and frontage of Faso Kaba

Mme Coulibaly, founder and owner of Faso Kaba, in her shop

Below and right: Faso Kaba's seeds

My life has changed. Today, we have fully mastered the art of maize cultivation Souleymane Konaté, farmer

The company also wants to develop the support element. It has therefore purchased two shelling machines with Mali Tractor Company. Now it not only deals with seeds, but also produces and processes maize.

Expectations

Mme Coulibaly: 'It is good to go every time through research to carry out activities, but people would have a better knowledge of the project if we could have our own funds to do more demonstrations.' She also expresses interest in more media attention, 'it might be even more interesting if we could be on television with processors or producers who would show their plots and tell how the whole programme has changed their lives.'

In terms of constraints, Mme Coulibaly talks about the need to have some means of transport for meetings and visits: 'We can't make more than one or two visits a year, although we need to be involved at all levels. This is a handicap.'

DONATA scores big in Mali

Souleymane Konaté is a farmer from Sanankoroba, some 30 km south of Bamako. As a member of the Ben-ba Association, he runs one of the Association's maize warehouses. He did not previously cultivate maize commercially, but the new technology disseminated by DONATA got him interested in the crop.

Souleyman Konaté with Dr N'Tji

'We used to have our traditional crop,' he says. 'We were not using manure and our small fields were not far from our houses. But we now have many hectares of maize. We have learned from the trainers in our area. The president of our association and some people who started growing maize before us share their knowledge with us. We obtain seeds through Faso Kaba, but we did not receive training from them. OHVN (*Office de la haute vallée du Niger*) officials provide us with technical support, but have not given us training on maize. It is the Ben-ba Association that supports and trains people in new methods of maize production. After the training, I adopted the "new method".

'I realised the advantages of this new project. Those growing maize in the traditional way did not get more than ten 100-kg bags per hectare. My life has changed. Today, we have fully mastered the art of maize cultivation. I feed 41 people in my family. I used to grow millet only. But since I started growing maize 2 years ago, my family has felt a change. I meet all the food needs of my family by selling maize. My harvested maize lasts a long time. I have realised that maize growing is more profitable than millet. With one hectare of millet you can get only 20 bags of grain, whereas you can get at least 30 bags of maize grain by following the guidelines and advice. This is why I cling to maize!'

Mozambique

Maize magic

In the next farming season, José Nhamene Chavango has big plans to double the 100 bags of Matuba, an early-maturing maize variety that he was able to produce last year. Matuba is one of several open-pollinated varieties (OPVs) of maize introduced to farmers through the IPTA by the Agricultural Research Institute of Mozambique (IIAM), the country's main agricultural research body.

Chavango, a seasoned farmer, has set his eyes on increasing yields and boosting income from selling the maize seed, grain and green maize that he grows on part of his 190-hectare farm north of the capital, Maputo. He credits new farming skills of using furrows to hold water as one result of increased interaction with extension officers achieved through the IPTA.

The introduction of OPVs has enabled farmers who previously planted saved grain from their own harvests to access better-quality seed via the platform. Given the agricultural conditions in the south of Mozambique, farmers sought drought-tolerant, early-maturing maize varieties

Many of the successful maize OPVs were developed at IIAM's Umbeluzi Research Station outside Maputo.

The extension workers taught me how to make the furrows hold water, which improved my farming techniques and contributed to better yields José Nhamene Chavango

José Chavango in his field

that gave better yields. 'This platform,' says DONATA focal person Anabela Manhica, 'helped narrow the gap between farmers, researchers and other agriculture stakeholders, who are all partners of Mozambique's innovation platforms.'

'The extension workers taught me how to make the furrows hold water, which improved my farming techniques and contributed to better yields,' says Chavango, adding that he has also learned how to properly space his maize, sowing only one seed per hole as opposed to the traditional practice of sowing three seeds.

Chavango is an inspiration to his community, having taken on the challenge of growing maize seed after attending demonstrations hosted by the Maputo IPTA to promote new farming technologies.

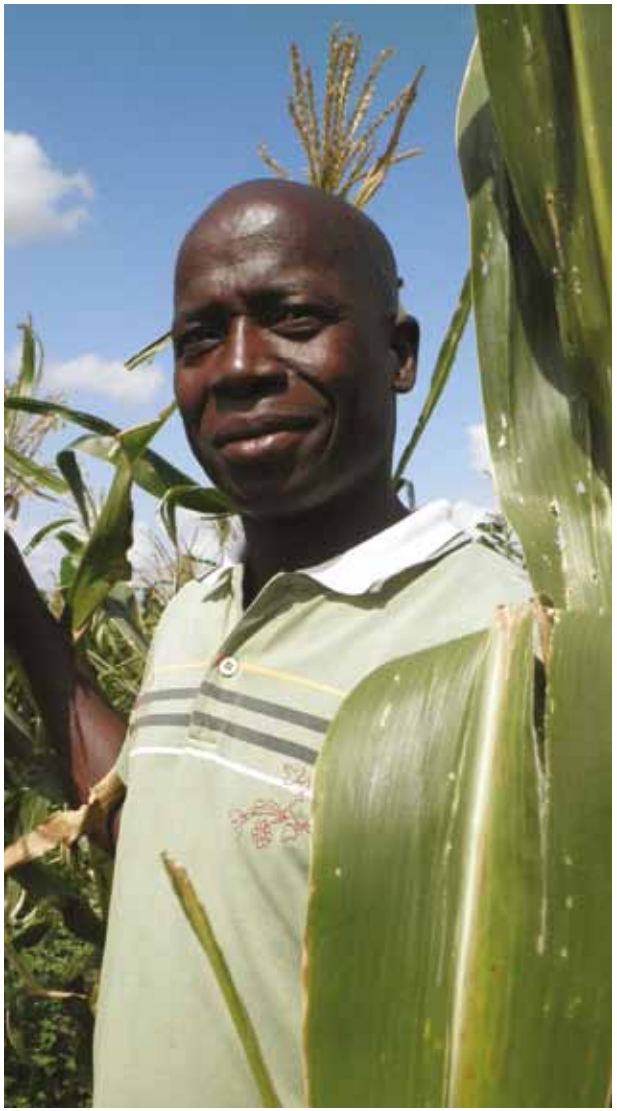
'I prefer Matuba and Chinaca seed varieties as they have performed well for me. Cobs from Matuba are longer than those of Sussuma, which has a shorter cob but big kernels,' Chavango says.

Over 10 years ago, Chavango returned to farm in his homeland after working on farms in South Africa. He has not looked back. His farm is a medley of maize, beans, vegetables and livestock. He has built a new home and bought cattle, fishing nets, a sheller and a new tractor with his farming profits.

With the new income gained from his improved knowledge of maize farming, Chavango's future includes a bigger sheller, a truck to transport his produce to market, and more cattle. Growing OPV maize has been his biggest source of success and he has shared his skills with workers and neighbours.

One of Chavango's apprentices is Augusto Melembe, who has specialised in producing grain. Melembe is a quick learner. After 6 years of farming, he has improved his techniques and the improved seed has boosted his yields. Currently, Melembe irrigates 2 hectares of Matuba and Sussuma. He is expecting to harvest about 4 tonnes of maize, which he will sell in the neighbourhood and in Maputo. He has ploughed some of the money from previous maize sales back into servicing his tractor and meeting household needs.

Melembe is so keen to be part of the Maputo IPTA that he has set aside 2 hectares in order to participate. He says he wants to build a small grinding mill to complement his small bakery business. Through his interaction with researchers and extension workers, even before being an active IPTA member, he heard about using Sussuma QPM flour in baking and is keen to blend it with wheat flour. This will help him cut costs and improve his products.



Augusto Mbelembe

The Maputo IPTA brings together researchers, millers, farmers and processors. Some members do not yet understand their roles, while others have grasped the idea of the platform and how it works. Agro-dealers have expressed an interest in supplying inputs to farmers at the village level, thereby cutting costs and saving time for farmers. Farmers need only to organise themselves to benefit from bulk purchase of inputs.

'We have developed a partnership with the government through the Ministry of Agriculture and have helped farmers like Mr Chavango acquire tractors because we highlighted their potential as farmers,' says Manhica. 'The strategy promoted by the IPTA is to enable farmers to buy subsidised seed and give back part of the maize after harvest, which is then distributed to other farmers who want to be part of the platform. The innovation platform improved my technology transfer methodologies. I've learned a positive way of bringing together almost all the partners in the maize value chain. The platform is a different way of transferring technology to farmers.'

Manhica says that the IPTA has improved interaction among farmers, extension agents and agribusinesses. 'Before we did not have much contact with extension – not like we do now. The platform allowed us to interact better with people in the marketing sector and with a greater number of farmers, as well as other researchers from different institutions and within our own institution. This gives me a new perspective on how to conduct research for development, even though the facilitation of IPTAs requires more time on organising consultations, interactions and field visits,' she says.

Another farmer, Amelia Alexandre Mbiza, president of the Vista Alegre Farmers' Association, has followed the IPTA closely after learning about it through Chavango. 'The IPTA is a good approach because it offers an opportunity to learn and share ideas. I feel we are learning from each other when we visit other farmers. With the IPTA, I relate better with researchers and they in turn understand better the specific challenges that farmers face. This collaboration will improve our farming methods and yields,' says Mbiza, who has planted Matuba. She says that Matuba produces more kernels than traditional varieties, giving more flour and better income.

Antonio Manuel Sitoe, president of SOGRIMA, another farmers' association, has also had good results growing Matuba and Changalani varieties. From the half hectare he planted in 2010, Sitoe harvested 1.5 tonnes of maize, while his association planted 3 hectares with the traditional varieties and reaped only 3 tonnes in the part of the land unaffected by the floods.

'The growing of improved varieties of maize has brought changes in my life in terms of nutrition and having seeds to share with my family members and with the community,' he says. 'My neighbours like the seed because it grows well. The cobs are good and you do not need to wait for them to dry to harvest them. One bag of OPV maize gives one bucket of grain after shelling. One bucket will cost between 100 and 200 Mozambican meticals (USD 4–7) during low demand. During high demand cost goes up to 400–500 meticals (USD 15–19).'

Amelia Mbiza, president of Vista Alegre Farmers' Association

With the new opportunity to discuss farming issues with farmers, extension agents and researchers, Sitoe can now express his problems easily. Like many farmers in Mozambique, Sitoe laments the lack of draught power, which makes production a difficult task even when farmers have been taught best farming practices and have improved seed.

'As farmers, we need a central warehouse to store our grain from the field and we need transport to take it to the market,' he says. 'With facilities we could move food to deficit areas of the country. The IPTA is an opportunity to collaborate because it is also a chance to talk to breeders and other specialists.' He goes further to suggest that the African Union should help in financing the training and deployment of more extension officers. Declares Sitoe: 'In Mozambique, I believe that if we train some of our farmers in agriculture, they can work as technicians and teach other farmers. We envisage a lead farmer approach to improving productivity.'

Constantino Senete, a breeder at IIAM, says QPM maize was introduced into Mozambique in 2000. Sussuma was welcomed by farmers because it is early-maturing, giving farmers without access to irrigation an opportunity for two or more harvests in a year. Sussuma was developed for the short rainy season in the northern part of the country. However, QPM maize is difficult to store (largely because insects enjoy it as much as humans) and there is no difference in the price of QPM and non-QPM seed in the market. Other varieties introduced by IIAM include drought-tolerant varieties like Chinaca and Djanza.

'Our level of technology adoption is not good because of the lack of knowledge,' says Senete, who is based at IIAM's Umbeluzi station south of Maputo. 'The big problems we have in Mozambique are low soil fertility and drought. Farmers produce about 1 tonne of maize per hectare due to problems of adopting technology, mainly improved seed and land management, but if we can improve on this we can increase the yields.'

Having interacted with farmers, the researchers at Umbeluzi station realise their limitations in responding to the greater needs of the farmers. They are now looking for organisations to interface directly with the farmers, organisations that could provide regular technical advice as and when farmers need it.

João Sambo, extension officer in Ilha Josina Machel District, says that the Maputo IPTA has given him the opportunity to transfer new technologies to farmers by improving the way he imparts information. 'It changed

The growing of improved varieties of maize has brought changes in my life in terms of nutrition and having seeds to share with my family members and with the community Antonio Manuel Sitoe

Constantino Senete, IIAM breeder

The platform has made it easier for me to work more directly – not just with farmers but with researchers too João Sambo

João Sambo, extension officer

the way I work. Before, I worked with individual farmers. But with the platform many people can learn together and also disseminate the technologies widely through discussions. The platform has made it easier for me to work more directly – not just with farmers but with researchers too.' He admits that initially it was difficult to get farmers to adopt new technologies and change their traditional farming practices. With the IPTA approach, this is no longer the case.

The limited sharing of new technologies is a result of the inadequate pool of extension agents in Mozambique. This is an issue that worries Feliciano Mazuze, technical director at IIAM, responsible for training, documentation and technology transfer. 'It has not been easy to get these technologies to farmers because farmers are not well organised in Mozambique – they are spread all over the country. They need to be organised into cooperatives or associations,' he says. 'Our extension network is not as effective as it is in some countries. We have about 800 extension agents in Mozambique overseeing 128 districts. If we had more of them, it would facilitate technology dissemination and we could reach more farmers.' The IPTA approach is helping to solve this challenge.

Feliciano Mazuze, technical director at IIAM

Through the IPTA, IIAM is increasing its understanding of how farmers adopt improved varieties, not just for maize but also for other crops such as sorghum, beans, cassava and rice. The increased interaction with all the stakeholders in the maize value chain is helping redefine the research agenda, such as the sort of varieties farmers prefer for drought tolerance, yield, colour and taste. Storage too has been a concern in the roll-out of the new maize varieties because of high postharvest losses.

'We have a national maize programme that has worked on QPM and released Sussuma,' says Mazuze. 'The knowledge gained from the innovation platforms has ensured that farmers are adopting the right varieties best suited to their regions.' He adds that Mozambique still needs to improve its policies to support the marketing of farmers' produce.

The Maputo IPTA has facilitated partnerships among government, NGOs and the private sector, leading to increased efficiency in the delivery of improved technologies to farmers. 'The idea is to improve our services to farmers as much as possible, such as finding the easiest way to reach the farmers. We need to establish more of these IPTAs. We are in the initial stage. Already we are improving the services to farmers such as delivery of farm inputs. We hope more stakeholders will join,' Mazuze says.

The knowledge gained from the innovation platforms has ensured that farmers are adopting the right varieties best suited to their regions Feliciano Mazuze

Farmer Ruth Alfredo Cossa says she prefers Sussuma because the cob is big and tastes good. She says that the variety also has better pounding qualities than other varieties even though weevil attacks during storage remain a problem.

For Ricardina Fernando Mangwana, vice president of a local farmers' group, Sussuma is sweet and gives a good yield. She has been able to buy a tractor and some pigs and cows from the proceeds of her maize harvest.

Tanzania

Improving access to promising technologies

In February 2009, DONATA established the Kilosa IPTA in eastern Tanzania to promote quality protein maize (QPM) among farmers and consumers.

Kilosa is one of the six districts that comprise the Morogoro Region. The town of Morogoro, 300 km west of Dar es Salaam, has grown into a city with a population of nearly half a million. As in most of East Africa, the most important crop here is maize. Tanzania has different varieties of maize suited to different environments, but most of them have low nutritional quality. Maize breeders have been searching for better-quality maize for a long time, and now they have found what they were looking for in QPM.

QPM is special because it contains twice as much of two essential amino acids – lysine and tryptophan – as traditional maize varieties. QPM, highly favoured because of its taste, is eagerly sought by consumers. Farmers who cultivate it find that sales contribute significantly to household food security and income generation. Of equal importance, they also find that QPM reduces malnutrition, especially among children. It

QPM cobs

The challenge now is to make the farmers and consumers in other parts of the country aware of the benefits of QPM

also reduces feed costs in livestock production because its nutritive value keeps the animals healthy without the need to purchase additional inputs.

QPM was introduced to northern Tanzania in 2001 through a collaborative effort between the Tanzanian government, CIMMYT (the Mexico-based International Maize and Wheat Improvement Center that originally developed QPM) and Sasakawa Global 2000 (a donor agency). The result of this collaboration was the release of two hybrid varieties and one open-pollinated variety (OPV). According to Dr Zubeda Mduruma – a former CIMMYT scientist who founded her own seed company, Aminata Quality Seeds – the farmers prefer OPVs that allow them to save their own seed for planting in the next season (as opposed to hybrids that oblige farmers to purchase fresh seeds each year).

The challenge now is to make the farmers and consumers in other parts of the country aware of the benefits of QPM. A good way to do this is through the DONATA project, which established IPTAs for this purpose at strategic locations throughout the country.

The farmer members of the Kilosa IPTA decided to name their platform Kimsiru Lishe. Kimsiru is a combination of the first letters of the names of the three Kilosa villages whose farmers joined the IPTA: *Ki*mamba, *Msi*mba and *Ru*dewa. 'Lishe' is taken from the Kiswahili translation of QPM, *mahindi ya lishe.*

Kimsiru Lishe is managed by two elected representatives from each village (total of six), a government officer, and a representative of Tanseed International, the seed company that multiplies and supplies QPM seeds to the members. The company, which is managed by Isaka Mashauri, an energetic and imaginative businessman, promotes QPM cultivation in a number of ways.

The IPTA adopted a threefold strategy. First was a series of sensitisation meetings to provide farmers with an understanding of the importance of QPM. The meetings attracted a total of 452 farmers (190 of whom were women). In its efforts to spread the word about QPM, the IPTA developed a flyer that explained the benefits for both humans and livestock. The flyer describes each of the three available varieties, giving details of colour, yield, duration, drought tolerance and resistance to pests. It also makes recommendations for good agronomic practices. Copies of the leaflet, in both English and Kiswahili, were distributed to hundreds of farmers in the area.

The second part of the strategy consisted of an analysis of the value chain. To do this effectively, the maize had to be cultivated properly. This meant distributing QPM seed, as well as appropriate amounts of agricultural inputs, pumps, boots, gloves and aprons – and even five ox ploughs. In 2008/09, the first year of the project, 3.5 tonnes of seed were distributed. This amount was increased to 5 tonnes in 2009/10. While production the first year was only 20 tonnes, the harvest in the second year was a resounding 800 tonnes – a 400 percent

Kimsiru Lishe meeting at Tanseed's headquarters in Morogoro

Leaflets describing QPM and its benefits were produced in both English and Kiswahili

increase! Part and parcel of the value-chain analysis was capacity development.

Four training sessions were attended by 155 farmers, the majority of whom were women. The sessions included components on agronomy and crop management, group management skills, entrepreneurial skills, food management for the household, processing and utilisation, leadership skills, harvesting, postharvest technologies, marketing strategies and price negotiation.

The third and final part of the strategy featured monitoring and evaluation. This important backstopping of the project included visits from officials of the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and the Forum for Agricultural Research in Africa (FARA), and follow-up of activities by the platform executive committee and extension officers.

The impacts of QPM cultivation are numerous, but here are a few details.

- More than 5000 people were exposed to QPM technologies through demonstrations, training sessions, field days and agricultural shows.
- With the profits:
  - 60 farmers bought improved roosters, 25 bought improved piglets, 7 bought heifers
  - 60 farmers were able to pay school fees
  - 16 farmers built new houses
  - 12 farmers bought motorbikes
  - 10 farmers bought bicycles
- Participation of QPM value-chain actors increased to include people working in production, postharvest, processing, marketing and business development.

One significant contributor to the overall economic value of QPM cultivation in the district is another seed company called Tanfeeds (not to be confused with Tanseed). Originally established as a public-sector undertaking in the 1970s (as was Tanseed), Tanfeeds was privatised in 2002. Realising that the best strategy for getting farmers on board with QPM cultivation was to involve them from the beginning, Tanfeeds supported a series of on-farm trials using QPM for broiler-chicken production. The trials resulted in fast growth of the birds, increasing farmers' incomes and enhancing their livelihoods.

Tanfeeds

QPM business is serious business

Suddenly, Beatrice was confronted with an unfamiliar situation – what to do with her unexpected windfall

According to Julius Malole, who is both researcher and production officer with Tanfeeds, the company's biggest challenge is to acquire larger amounts of seed. Addressing this challenge, Tanfeeds distributes QPM seeds to farmers throughout the district. The company prepares posters and leaflets about QPM for dissemination at agricultural shows, trade fairs and anywhere else that farmers gather.

Another challenge, says Malole, is to get the QPM grain back to the Tanfeeds milling centre in Morogoro so it can be made into flour and packaged for sale to local supermarkets.

The challenge is to find ways to reduce the cost of getting the QPM grain to the milling centre. To make the operation cost-effective, some farmers pool their money to hire trucks. Another challenge is to keep the cost of QPM low. Despite its many advantages, if QPM is even marginally more expensive than other varieties, poor people simply will not buy it. Publicity is needed if the flour is to be sold at a higher cost.

One thing is certain: there is a definite market for QPM. Shopkeepers in Morogoro report that they have difficulty keeping sufficient stocks, and that when they run out, consumers are quick to scold them!

If you ask any person in any country, male or female, rich or poor, what the most desirable things in life are,

Raising chickens, raising children – how QPM changed one woman's life

Farmer Beatrice Shayo raises broilers. She was invited by Tanfeeds to participate in an on-farm QPM trial in March 2010. Starting with 1030 birds fed exclusively on QPM, Beatrice saw them achieve full growth in only 4 weeks as opposed to the usual 6 weeks it took with traditional feeds. The good news did not stop at the speed at which the birds grew – mortality rates were also much lower than with the feeds she had used previously. Although she lost 15 birds, she was able to sell 1015.

And the good news kept coming. She found that nourishing her birds with QPM had made them uniform in size and weight. Earlier, using traditional feeds, some birds grew bigger than others, and the sale price would vary from 4500 shillings (about USD 2.75) for the largest down to 3000 shillings (USD 1.83) for the smaller, weaker birds. But with QPM, Beatrice was able to get the full 4500 shillings for every one of them.

Suddenly, Beatrice was confronted with an unfamiliar situation – what to do with her unexpected windfall. After thinking over the alternatives, she decided to pursue a girlhood dream – to become a kindergarten teacher. Enroling on a tertiary course in early education, Beatrice earned a Certificate in Early Education, was employed at a local school, and now earns a salary.

And what about her poultry business? Totally sold on the benefits of QPM, Beatrice is currently raising 2500 birds, over double her earlier stock.

Morogoro shop

most would answer health and prosperity. If that is so, QPM is helping increasing numbers of Tanzanian farmers and their families to achieve this happy state.

Good news at the orphanage

Mrs Hatma Hakim is a most remarkable woman. Most farmers have more than they can handle just cultivating crops or raising livestock – she does both. But she did something else, something quite extraordinary – she founded an orphanage. This haven for children whose parents have passed on prematurely is called the Human Sympathy Association, or HUSA for short.

The Human Sympathy Association (HUSA), a haven for orphans

Familiar with the benefits of QPM from her exposure to it via the Kilosa IPTA, she introduced the 'miracle' maize to her orphanage. The results were extraordinary. Mr Robert Mwaga, Executive Officer of Kimamba Ward, the political region to which Kilosa belongs, says, 'Most of the kids were malnourished when they arrived. But with QPM diets, 95 percent of them are healthy.'

HSA constructing their new facility

What makes QPM ideal for nurturing children is its high protein content. But there's something else – it tastes good! HUSA staff say that they can make QPM porridge virtually without sugar: 5 spoons of sugar in 10 litres of porridge are sufficient. With other maize meal it takes 25 spoons (one kilogram) to make the porridge palatable.

Prosperity comes in various ways

With the profits she made from cultivating QPM as an outgrower for Tanseed, Zaina Kismanya was able to buy a television and a music system. More importantly, she paid her children's school fees. Her children, she says, are very healthy on their diet of QPM. They wolf down their maize porridge without any sugar at all.

A farmer from Handini District, Saidi Gelegeza is also an inventor. He used his QPM profits to improve his groundnut-grinding machine. With this machine, which is driven manually by a modified bicycle frame, he gets the equivalent of 12 litres of groundnut oil per hour, a third of the time it would take him by hand. Gelegeza reports that his list of customers is growing daily.

Hatma Hakim, the founder of HUSA, the orphanage mentioned in the previous box, is also a successful farmer. With the profits from her involvement with the Kilosa IPTA and her sales of QPM to Tanseed, she purchased a big, healthy dairy cow. When asked what she had named her productive animal, she replied, 'Her name is IPTA!'

Uganda

Transforming lives with technology in Gulu

Bio-fortified sweet potato and maize

DONATA established IPTAs in Gulu and Lira districts in northern Uganda in 2008. The IPTAs focus their efforts on orange-fleshed sweet potato (OFSP) and quality protein maize (QPM). These two strategic foods have been 'bio-fortified' – OFSP with vitamin A and QPM with protein. They were introduced after the Government of Uganda realised that expectant mothers and children in Gulu and Lira Districts were experiencing severe deficiencies in vitamin A and protein, both of which are critical for cognitive growth and protection against infections. The IPTA approach was used to disseminate these two technologies across the country. Participating in the IPTAs has helped not just farmers, but also entrepreneurial women, who have expanded their income base.

Pauline Okelo, a successful entrepreneur from Layibi Aywe village, has converted her kitchen into a small bakery, where she makes all manner of cakes, buns and bugia. Layibi Aywe is about 4 km from Gulu city, the district capital. Okelo has done very well

When I started mixing QPM into my products, people liked them and came back for more Pauline Okelo

for herself. She gained knowledge on the use of OFSP and QPM through her participation in the Gulu IPTA.

She built the business from a personal interest in baking, a skill honed when she worked as a lay helper in a church mission in Gulu. After training in baking and value addition sponsored by the IPTA, Okelo found a niche business opportunity by using OFSP and QPM flour. It is her use of OFSP and QPM that keeps her customers coming back for more. Today, Okelo has a booming bakery business where the sweet aroma of cakes and buns greets visitors.

Every week, a salesman wheels his bicycle into Okelo's clean, landscaped compound to collect wrapped cakes, buns and cookies for sale in Total Select shops and supermarkets in Gulu. The products are the result of a process that begins in the kitchen. Okelo blends OFSP and QPM flours with wheat and cassava flours, a little sugar and salt, *ngano* and mixed spices.

Okelo received QPM seeds in 2009 through the IPTA, and since then has grown them in a 10 square metre plot near her home. She notes that QPM gives a better yield than ordinary maize – even during seasons with poor rainfall. In addition, QPM has a special aroma that attracts customers.

'I started using QPM in my baking after attending a training course organised by Mega FM with trainers from Kawanda. The training improved my products and increased my income,' she says. 'I used to get a profit of about 10,000 shillings (USD 3.50) a week when I started and now that has doubled. When I started mixing QPM into my products, people liked them and came back for more.'

Okelo has bought a bicycle to transport her products into town and to bring back raw materials. She has also bought a small generator for watching television and for lighting at night when she packs her products for dispatch. Part of the income from the business has paid school and university fees for her children.

'My customers enjoy the products,' says Okelo. 'QPM is sweeter – porridge made from QPM doesn't even need sugar. I have applied local knowledge in using both QPM and OFSP flour. When you eat one cake with OFSP flour it is just like you have eaten 12 cakes made with ordinary flour!'

Friends and relatives have asked Okelo for QPM seed and she is planning to give them at least 5 kg each so that she can recruit them as suppliers of QPM grain for her bakery. Okelo has trained more than 100 women in Amuru District (east of Gulu) on how to make cakes and juice using OFSP. In the future, she would like to sell her products to wholesalers who can afford to buy in bulk.

Okelo in her kitchen showing an open oven with OFSP-based products (left); with her wrapped products in her home (centre); and Okelo in the QPM maize field near her home (right).

Getting the word out via community radio

In its desire to reach the maximum number of farmers, Gulu IPTA engaged with Mega FM, a local radio station broadcasting in northern Uganda to the Luo community. The station has transformed perceptions about OFSP and QPM. Okelo benefited from training organised by Mega FM. Grace Amito, the producer of the *Lobo Lufu* (Farming World) programme, says Okelo was an inspiration to the community. Simply by following the training transmitted by the community radio, she has gained knowledge about the use of OFSP and QPM.

Grace Amito in the studio

'I am excited that Pauline took the training on adding value to OFSP and QPM seriously because of the radio programmes we produced,' says Amito. 'We put on more than 10 radio programmes on QPM and the number of people who have knowledge on QPM has gone up.'

Through *Lobo Lufu*, 35 farmers received QPM seed in 2010, generating more interest in cultivating the crop. Farmers who listen to the programme have reported better yields from QPM, which has enabled them to pay school fees for their children and to meet other costs.

'We have faced the challenge of convincing farmers that QPM is not ordinary maize but one with high nutritive value and price,' Amito says. 'Marketing QPM is still a constraint because farmers deal with middlemen who take advantage of everything. We have started a programme, *Mega Market News*, which airs every Tuesday and Thursday. On the programme, we tell the farmers the latest market prices not only for maize but also for other crops – beans, *sim sim*, groundnuts. A key problem is that there is no price discrimination for QPM, as it does not *look* any different from other types of maize.'

We put on more than 10 radio programmes on QPM and the number of people who have knowledge on QPM has gone up

Grace Amito, Producer, Lobo Lufu (Farming World)

Amito, who has been broadcasting in Luo since 2004, says that the audience has increased as a result of the programmes on QPM. Specialists are invited to the programme to advise farmers on QPM, and listeners are invited to phone in and participate in a quiz on what they have heard. Prizes in the form of QPM seed are given to lucky listeners.

As a result of the innovation platform, Amito started a *School Farming Programme* to help schools that have suffered from high food prices and food shortages to grow their own QPM. This has also encouraged students to see value in agriculture by their participation in food production at school level.

The *Lobo Lufu* programmes are synchronised with the farming calendar and have attracted new partnership for the IPTA and for Mega FM. The partnership with Mega FM has helped in extension service delivery. Its *Lubo Lufu* programme has sensitised farmers on critical issues such as best agronomic practices. It has also made training simple for extensionists because some concepts are explained during live programmes.

Through interaction within the Gulu IPTA, the radio station realised that grain storage became a challenge

to the community when production increased. Farmers required proper storage as they claim that the smell of QPM maize was so sweet that even rats find it irresistible! Consequently, the radio station launched a new programme called *Purchase for Progress*. The programme is supported by the World Food Programme, which has opened a grain warehouse in Gulu to encourage farmers to store their harvest for a small fee until the market price improves. This initiative addresses the storage problem farmers face in the area. Good storage facilities allow farmers to hold their grain until they are happy with the market price. With the new partnership, farmers are earning three to four times their usual income.

The national research organisations in Uganda saw the changes in farmers' lives when the IPTA was used to disseminate technologies in various communities. To spread the success further, the Uganda DONATA team funded a 3-day trade show where farmers shared a number of experiences on QPM. This was attended by at least 10,000 farmers and extension agents, as well as the media, which has started writing stories about the platform and new technologies from research.

One example is Amito, who won the 2010 Dr George Atkins Award given by Farm Radio International for her work with farmers. She says that a policy is needed to promote the use of local materials in the making of local products to boost the amount of QPM and OFSP in local foods. This will give farmers incentives to increase their production of OFSP and QPM.

The Uganda government is now using the concept of IPTA in disseminating new technologies from research. This approach of promoting QPM has paid off – the Uganda government is helping more farmers grow QPM.

Partnerships, collaboration and other benefits

According to extension officer and Gulu IPTA focal person Charles Komakech, the IPTA has helped improve the collaboration among extension service providers, private sector, researchers and farmers.

The Gulu IPTA, which started with eight farmer groups, has increased farmer participation threefold to 24 groups – all attracted by the opportunity to access and share information on farming. The availability and quality of maize seeds was identified as a contributory factor to low yields. When sowing traditional seeds, farmers harvested about seven 100-kg bags per hectare. But now they are harvesting 9–11 bags without the use of fertilizers. For those who can afford to apply fertilizer, yields have gone up to 14 bags. A seed loan system was developed that works on the basis of 10 percent interest – paid back in the form of seed to sustain the seed bank so that other farmers can benefit.

Farmers also lacked technical knowledge on planting, postharvest handling, and farming as a business. 'With the traditional way of farming, farmers were getting very low yields that did not cover their production costs, but with the improved way of farming accessed through the IPTA, farmers can improve their yields and sell their surplus, thus covering the input costs. In our case, QPM was the solution,' says Komakech. 'The IPTA was an opportunity to provide support to the farmers. For instance, the demonstrations we conducted attracted farmers to set up demonstrations on their own farms. By farmers replicating the results of the researchers' demonstrations on their own farms, other farmers have come to learn the best practices too. In the process, we identified gaps – while researchers may be concentrating on a particular technology, we learn from farmers that they are interested in something else and so there is cooperation.'

Komakech says that some of the participating farmer groups are using the proceeds from QPM for restocking. They sell the seed after production and use the money to buy livestock. A group in Patiko, for example, bought 15 goats with money from growing and selling QPM.

'Our plan is to increase the number of farmers growing QPM through the IPTA. So far we have 22 farmer groups working on grain production and only two groups on seed production. We plan to increase the number of seed growers to four and grain producers to 50 farmer groups. Apart from the target groups, the farmers themselves are giving seed to other farmers who are not targeted by the project. We expect this farmer-to-farmer approach of upscaling to help,' says Komakech.

The Gulu IPTA has identified a key partner in the Uganda National Agro Dealers Association (UNADA) to help farmers access agro-inputs.

The technology was based on nutrition, but we learned through farmer experience that this technology has a component of drought tolerance... Julius Serumaga, plant pathologist

Realising that the market for grain is unstable, the Department of Production under the Ministry of Agriculture is helping farmers to start milling QPM grain and participate in value addition through processing, since demand for maize flour is constant while that for grain is volatile.

The IPTA has triggered other benefits such as the introduction of revolving loans and savings called *bolejo*. Every month when members of the farmers' group meet, every member saves some money according to their ability.

The Gulu IPTA has attracted other partners, like Pearl Seeds, an independent company that supplies QPM seed.

Julius Serumaga, a plant pathologist working on maize and rice at the National Cultural Research Organisation (NACRO), says that partnering with different organisations under the IPTA has helped his organisation reach more farmers. Through Mega FM, the new technologies have been scaled up, thereby increasing adoption rates and use of QPM.

'The improved protein content of QPM helps farmers who cannot afford to buy milk or animal protein – by eating QPM they have the protein they need. Selling the product also increases their income and standard of living,' Serumaga says.

NACRO, based at the National Crops Resources Research Institute, hosts the DONATA programme. In addition to coordinating the funds for DONATA, FARA has helped spread the good news about these technologies through the Regional Agricultural Information and Learning System (RAILS).

'Previously we focused on research and developing technologies, but this project has enabled us to identify farmer preferences. The technology was based on nutrition, but we learned through farmer experience that this technology has a component of drought tolerance, which is very important to them. Hence, working with other partners, sharing lessons, outscaling, and feedback from farmers have improved our research so that we can also improve on that technology. Our research is now demand driven,' comments Serumaga.

Training and benefits

The Akwor Ki Lweta farmer group in Baliya village has been growing QPM since 2009. It has a seed multiplication site for QPM foundation seed, which it expects to be certified by the Ministry of Agriculture for distribution to farmers. The group started with 2 ha of seed in 2009 and increased this to 3.2 ha in 2010, but a shortage of seed forced it to reduce the land area to 1 ha in 2011. Despite the challenge of sourcing seed, farmers in this area speak highly of the benefits of growing QPM.

Below: Charles Otto Opal; Right: David Oryem

'Selling QPM maize has helped me pay school fees for my children, but a limitation is that our group cannot mass produce QPM to increase our returns,' bemoans David Oryem, chairman of the Akwor Ki Lweta group. 'As a group of farmers we have used the money for replenishing our livestock. In the past we had a problem of malnutrition and QPM has helped our children. At first it was difficult to adopt this technology, but with training from farmers who have been trained, more of us switched to QPM and have been able to address the challenges experienced before the training.'

The IPTA training of trainers has facilitated reaching more farmers. A member of the Akwor Ki Lweta IPTA group, Charles Otto Opal, admitted that at first training other farmers was difficult because it was a new thing. It was also a challenge to reach all the members of the group around the village. But this has all changed since farmers started participating in the IPTA. They are now reaping the benefits of the new knowledge gained through the platform, especially about QPM. Opal now has a bicycle to help him get around, bought with the extra income gained from the past season.

Challenges in postharvest activities

Confirming that QPM has changed the livelihoods of farmers through improved food security and enhanced income, Kilara Margaret Mickey, chairwoman of the Gulu IPTA and member of Akwor Ki Lweta, says that QPM is difficult to store.

'Growing QPM has helped our members improve their livelihoods as they have used the money for various expenses. Sometimes the grain is sold to pay school fees and sometimes they gave it to help patients in the local hospital, but the main challenge is storing the grain,' says Mickey. 'We store the grain in our homes in sacks. We cannot add chemicals because we will need some of the grain for immediate consumption. But we need to consume it quickly because the weevils like it very much. I think it is too sweet and it cannot stay long in storage before it is attacked by weevils.'

The IPTA members are now analysing how to maximise the income potential from the increased production of quality maize. They agree that they have to further increase their volume to reach markets with better price for their maize. In 2010, the group planted 8 ha and harvested 500 bags. In 2011, it expected to harvest 800 bags from 23 ha.

'Our wish is to own a grinding machine and sell QPM as flour because it sells better than grain,' Mickey says, adding that members needed further training on pest management and value addition, especially in making products with QPM flour.

In Pajaa village, the Gen Kumi farmer group started growing QPM maize in 2008 after obtaining seeds from the IPTA. Their yields have increase because of the better quality of the seeds. However, George Nyeko Kaka, chairman of the group, says draught power is a challenge as the group does not have a tractor and manual tilling is limiting. The group is now discussing how to best acquire this equipment.

Kilara Margaret Mickey

Members of the Akwor Ki Lweta group

Sometimes the grain is sold to pay school fees and sometimes they gave it to help patients in the local hospital, but the main challenge is storing the grain Kilara Margaret Mickey, Chairwoman of the Gulu IPTA

In addition to QPM, the IPTA in northern Uganda has promoted the growing of OFSP. Richard Mannasseh, researcher at Gulu University of Agriculture and focal person for the DONATA OFSP project, says that sweet potato is an important component of the farming system in northern Uganda, serving primarily as a food-security and cash crop, second only to rice in Amuru and to cassava in Gulu.

He bemoans the fact that the land allocated to sweet potatoes is still low – on average only 0.3 ha of household land, about 9 percent of a typical landholding in Gulu and only 3 percent in Amuru. 'The vision for the IPTA is to make OFSP the preferred sweet potato technology in northern Uganda and develop a competitive OFSP value chain,' says Mannasseh. 'The participation of researchers in the IPTA has improved interaction with farmers because the platform offers opportunities to influence the operations of the National Agricultural Advisory Services in getting feedback to end users of OFSP.'

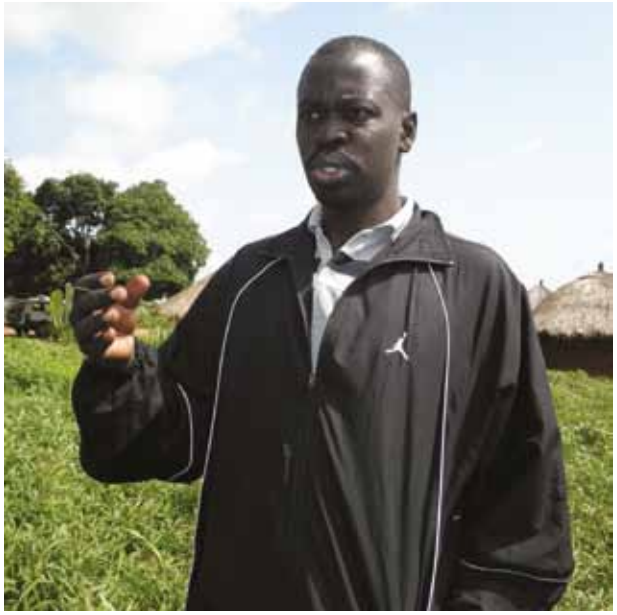
The platform has also enriched the experiences of both farmers and researchers through information sharing. A survey undertaken by Gulu University on OFSP revealed that farmers have different experiences on the taste of OFSP. Some felt the taste and aroma of OFSP flour are intense and limit how much one can eat. Others reported that because white-fleshed sweet potatoes were common, people needed to adjust to the orange-fleshed varieties.

In 2009, farmers were given four OFSP varieties and, after an initial phase of technology testing, individual households selected their preferred varieties and began cultivating them.

'The system fits in a small plot where they grow more than four varieties. One reason for doing this is that the varieties mature at different times,' explains Mannasseh. 'So, the argument is that early-maturing varieties save you by providing a quick harvest, but the late-maturing varieties stretch the period after the normal harvest season. Sweet potato is more effective when there is a range of varieties in the village. If they grew just a single variety and a stress situation arose, they would risk crop failure. That can be avoided with a mixture of varieties. Farmers save dedicated materials they believe have demonstrated market value.'

Through IPTA discussions, Mannasseh realised that it was critical to consolidate supplies so that farmers did not lose the benefit of their labour and were able to deliver their products to the market. He says that farmer groups are good for the introduction of technology but not for sustaining it, because group fields are difficult to maintain. Individual households are now integrating their preferred OFSP varieties, particularly Kakamega and Ejumula, into their mix of sweet potato. Part of the preference includes sweetness and yield of the OFSP.

'Taking full advantage of OFSP will require expanding product portfolio, access to markets, and commercialisation of value-added products such as the development of OFSP-based recipes, cakes, chapati and *mandazi*,' says Mannasseh. He believes that some of these challenges can be resolved within the IPTA through discussion. Besides the farmer group, the IPTA is now engaging with the agribusiness sector to strengthen the commercialisation of the farmers' products.



Richard Manasseh, Lecturer, Gulu University

Many Ugandan farmers now cultivate OFSP and QPM. They are benefiting through increased income of at least three- to four-fold. They are also exposed to new opportunities for selling their produce rather than having to sell it immediately after harvest.

Zambia

Back to basics with sorghum

The IPTA in Lusitu – about 200 km south of Lusaka on the Zambian side of the Zambezi – is helping researchers and farmers get the most from their land using drought-tolerant sorghum.

It would not be a misnomer to say that Joe Makwenda has built his thriving shops with sorghum.

Makwenda is one of several farmers in the Lusitu Valley for whom sorghum – a hardy cereal grown for generations – is the source of personal and community success. With sorghum, farmers have managed even during seasons of scanty rainfall. Thanks to the IPTA approach, farmers can now easily access new technologies such as improved varieties of this drought-tolerant cereal, ensuring food security and income for more than 200 farmers in the Lusitu farming community.

Innovation platforms have facilitated the supply of improved sorghum varieties to Makwenda and proved that there is money in sorghum. With the income they make from sorghum, Makwenda and his wife have roofed a new house and are planning to build more houses for rent to support their five children.

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Joe Makwenda's new house

'I have built two shops from the profits accrued from increased sorghum production. I've been farming sorghum for more than 10 years,' says Makwenda, a member of the Lusitu Seed Growers Cooperative.

As a seed grower, Makwenda prefers shorter, early-maturing sorghum varieties. Short varieties, he says, make it easier to see the birds. Left uncontrolled, birds can easily destroy an entire season's harvest. In addition, improved varieties ensure better yields, allowing him to plant early and to harvest within 90 days.

But with the increased production comes the challenge of selling at a good price and postharvest management. 'After threshing, I sell my seed to seed companies and to other farmers,' he says. 'If there are no customers, I sell it to others as grain. These days the market is difficult. I used to sell my sorghum to Kamano Seeds, but they no longer come to buy. We tried Zamseed, but they have not come yet either.'

Some breweries are good markets for sorghum farmers like Makwenda, but they are offering lower than farmers' expected prices. Sorghum seed currently sells for up to 110,000 Zambian kwacha (USD 22) for 50 kg, but some companies offer as little as 45,000 kwacha (USD 9).

'When the market is not there, we thresh and grind some of the sorghum and sell it as flour or sell directly as grain to the miller. As it is, my current crop has not been purchased and if someone comes today I will sell. I have not threshed it yet, because once it's threshed it is quickly attacked by insect pests,' Makwenda says.

Apart from the challenge of postharvest pest attack, stalk borers are also a threat to the crop, especially if farmers delay planting. Sorghum in Lusitu is usually planted between mid-December and mid-January if the early rains are heavy enough. But farmers, limited by lack of draught power for field preparation, plant early to take advantage of the early rains in December.

Makwenda's neighbour, shopkeeper Watson Halenga, says sorghum farming saved him from joblessness. He started growing sorghum on a small scale, harvesting only 15 bags, but today he tops 100 bags even though at times selling the crop is difficult because of low prices.

'The market is not easy because sometimes you grow the crop and people do not come to buy. You end up distributing sorghum to the people who assist you in weeding on the farm,' says Halenga, who calls for

Watson Helenga

the establishment of a proper marketing system for sorghum farmers.

'My life has improved since I started growing sorghum,' he says. 'I had no shop, no house. But now I have managed to build two shops and three other houses for rent. My family is involved in farming and we work together in growing sorghum.'

Masten Muchindu

Halenga has thought about adding value to his crop but has feared taking a risk – he wants to know more about value addition before trying it. He says there is a future in sorghum farming if the market for the crop can be assured.

A sorghum and maize farmer in the same district, Masten Muchindu, has completed a 10-room house that he will be letting out for rent. He has also bought livestock and farm implements, which he says would not have been possible had he just focused on growing maize. 'Even in poor rains, I have been able to harvest something from my sorghum fields. This year we had poor rains, so I expect 70 bags – a lot less than the 120 I realised last year,' he says.

Another farmer, Friday Hambwelu from Silwendo village in Siavonga District, managed to build up a herd of 15 cows after venturing into sorghum farming in 1991. He was able to send all seven of his children to school and is planning to build a bigger and better house in the coming year. The current season was a drought year, but he still harvested forty 50-kg bags of sorghum, which he threshes, bags and sells to traders and companies as both seed and grain. 'Growing sorghum has brought many benefits, but the shortage of labour – especially during weeding and harvesting – is a problem for me. Also, I often face a shortage of seed,' he says.

As a mother, grandmother and cultural custodian, Grace Ngezi has cultivated, prepared and eaten sorghum all her life. She is understandably surprised to hear that this hardy cereal is being promoted as a strategic crop. In Lusitu, which is characterised by droughts and an

Friday Hambwelu, sorghum farmer

annual rainfall of just 600 mm, sorghum commands more respect than maize. For 67-year-old Ngezi, sorghum plays a pivotal role in traditional ceremonies, giving it a sacred status in the food chain and a strategic place in the way of life of the Lusitu community.

'Sorghum is part of our lives. We use it in the form of traditional beer to appease and thank the ancestors

The innovation platform has improved the way we do research because we can hear the farmers' views and problems Donald Mwandila, Research Technician

Grace Ngezi (left) and a relative brewing traditional sorghum beer.

for good fortune. Commercial beer cannot be used for this purpose,' she says. 'For us, sorghum is everything. As long as we sow the sorghum that our parents have sown for generations, we know we will get something, even in bad harvests.'

Harnessing the potential of sorghum

Through the IPTAs, farmers increasingly appreciate the potential of sorghum beyond its traditional uses and as a staple crop for drought-prone farming communities, like Lusitu. And now, the new spectre of climate change has reared its head. Farmers understand that sorghum is not just an insurance against food insecurity, it is also a guarantee of income.

The innovation platforms allow farmers, extension workers and researchers to work together and conduct agronomic and entomological trials for sorghum in farmers' fields. Donald Mwandila, a research technician involved in the IPTA, says that sorghum farmers have shown a preference for white varieties because these are favoured for flour making, while brown varieties are favoured for beer brewing.

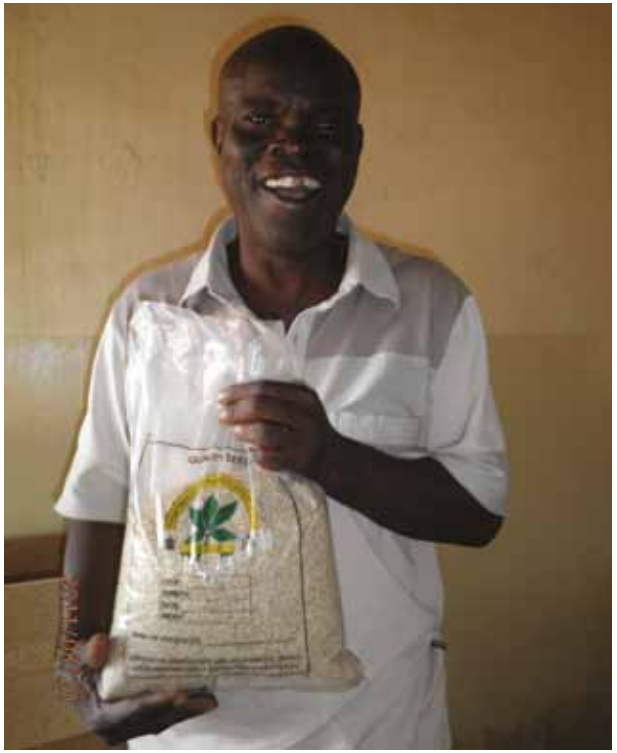
'The innovation platform has improved the way we do research because we can hear the farmers' views and problems. The scientists involved are also present and they can incorporate these views into their breeding programmes. That way, the benefits are wide,' Mwandila says. He adds that the innovation platform has enabled researchers to learn from farmers, whose indigenous knowledge about sorghum is assisting in improving research on sorghum.

Meeting the market challenges

Market linkages constitute an important element in promoting food productivity, not only for sorghum farmers but throughout Africa. Farmers are known to suffer up to 40 percent losses during the postharvest period because they have neither access to markets nor a guaranteed market for their produce. The improved varieties have given farmers increased production. Now they face the challenge of how to sell the extra produce.

The improved sorghum development programme in Zambia started 1992, when an early-maturing variety was introduced for farmers in drought-prone areas.

Donald Mwandila, Research technician, Lusitu



It is easy to tell that our farmers have taken the advice we have given them because we are seeing the fruits of their produce Epher Siyunyi, agriculture supervisor

Epher Siyunyi, an agriculture supervisor based at Lusitu station, is responsible for the transfer of agricultural technology to farmers through training, exchange programmes, tours and agricultural fairs, especially seed fairs. She has made sure that the traditional late-maturing varieties have been complemented by early-maturing varieties, which Siyunyi says have been widely adopted by farmers.

In one of the IPTA meetings in Lusitu, farmers brought up the issue of market access. Farmers have successfully grown more than 200 tonnes of sorghum, but had to be assisted in selling it to the right market at a good price. The innovation platform then invited agribusiness representatives from Kamano Seed and Zamseed to meet the producers. Farmers discovered the advantages of becoming seed growers and being able to sell directly to seed companies. Initially, there were only 30 seed growers. Later this increased to 60 farmers who mostly grew sorghum. Today, there are over 100 farmers growing sorghum on a commercial scale, including those who still grow traditional varieties but who have been taught about farming as a business.

'It is easy to tell that our farmers have taken the advice we have given them because we are seeing the fruits of their produce. Farmers who previously used only hand hoes now have draught power, and farmers who lived in grass houses now have improved homes with aluminium roof sheets. Apart from that, sorghum farmers with shops are mushrooming in the area, while others have bought hammer mills,' Siyunyi says.

Explaining that sorghum plays a big role in food security, Siyunyi said that maize does not do well in Lusitu, but farmers have something to eat from sorghum and the surplus goes to the market. Training farmers on seed growing has unleashed entrepreneurs who now see farming as business. Moreover, Siyunyi says, farmers have also adopted conservation methods like pot-holing (creating depressions around the bases of plants to increase water retention) to improve their yields in water-stressed areas like Lusitu.

Through the success of the IPTA, sorghum is now being promoted in Zambia as a pathway out of poverty with its high cash and value-addition potential. Zambia has embarked on a food crop diversification programme in which sorghum is a priority.

Lloyd Mbulwe's bumper sticker says it all – Sorghum is back!

Davy Simumba from the Zambia Agriculture Research Institute (ZARI) says that, in line with the national agriculture policy, ZARI is promoting the status of sorghum in the country to turn it from a subsistence crop into a commercial one.

'Sorghum has withstood the test of time because you do not need many inputs to grow it and, with the development of technologies and machinery, people should now be able to grow sorghum and process it with less labour,' Simumba says.

As much as the farmers are gaining new income and business, the innovation platform continues to function whenever farmers, researchers and extension interact. The potential of sorghum as a source of innovative commercial by-products has attracted interest from agricultural researchers in Zambia.

Agricultural researchers, encouraged through direct interaction with farmers, are now more enthusiastic to work on improved varieties to meet the needs of farmers – needs that include resistance to pests and diseases, less vulnerability to birds, good grinding properties for flour, and adaptation to climate change.

According to ZARI plant breeder and researcher Lloyd Mbulwe, ZARI is promoting value-addition to sorghum to produce commercial beer, sugar, ethanol, cereal, pasta and other products.

‘We know farmers need to grow this crop, but they have faced a lot of challenges in marketing it,’ he says. ‘To assist them in marketing the crop, we are using RAILS (FARA’s Regional Agricultural Information and Learning System) to explore opportunities. It is helping us make information flow from researcher to extensionists to farmers. The future for sorghum is very bright because it is being strongly promoted and we are working with industry to show farmers that many value-added products can be produced from it. Sorghum can change the lives of farmers, because it can be used as dual-purpose crop – for food and, when the stalks are crushed, for sugar used in ethanol production.’

Sorghum can change the lives of farmers, because it can be used as dual-purpose crop – for food and, when the stalks are crushed, for sugar used in ethanol production

Lloyd Mbulwe

About FARA

FARA is the Forum for Agricultural Research in Africa, the apex organization bringing together and forming coalitions of major stakeholders in agricultural research and development in Africa.

FARA is the technical arm of the African Union Commission (AUC) on rural economy and agricultural development and the lead agency of the AU's New Partnership for Africa's Development (NEPAD) to implement the fourth pillar of Comprehensive African Agricultural Development Programme (CAADP), involving agricultural research, technology dissemination and uptake.

FARA's **Vision**: reduced poverty in Africa as a result of sustainable broad-based agricultural growth and improved livelihoods, particularly of smallholder and pastoral enterprises.

FARA's **Mission**: creation of broad-based improvements in agricultural productivity, competitiveness and markets by supporting Africa's sub-regional organizations in strengthening capacity for agricultural innovation.

FARA's **Value Proposition**: to provide a strategic platform to foster continental and global networking that reinforces the capacities of Africa's national agricultural research systems and sub-regional organizations.

FARA will make this contribution by achieving its *Specific Objective* of **sustainable improvements to broad-based agricultural productivity, competitiveness and markets.**

Key to this is the delivery of five *Results,* which respond to the priorities expressed by FARA's clients. These are:

1. Establishment of appropriate institutional and organizational arrangements for regional agricultural research and development.
2. Broad-based stakeholders provided access to the knowledge and technology necessary for innovation.
3. Development of strategic decision-making options for policy, institutions and markets.
4. Development of human and institutional capacity for innovation.
5. Support provided for platforms for agricultural innovation.

FARA will deliver these results through the provision of networking support to the SROs, i.e.

1. **Advocacy and resource mobilization**
2. **Access to knowledge and technologies**
3. **Regional policies and markets**
4. **Capacity strengthening**
5. **Partnerships and strategic alliances**

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