

Community-based seed production: Limpopo farmers' strategy to resist drought

Introduction

In 2001, Ms AT Didiza, Minister of Agriculture and Land Affairs at the time, commented on a new innovation to increase maize production. She was speaking at the Cedara Agriculture Centre in Pietermaritzburg as part of "Agricultural Research Week":

"Maize is one of the most important staple foods in South Africa. The success of this South Africa-CGIAR partnership shows that there is enormous potential to improve agriculture and rural livelihoods for the poorest farmers in South Africa. This scientific breakthrough shows the enormous benefits of South Africa's investment in national and international agricultural research."

At that time the Minister might not have known that Limpopo Province would have a multiple-award winning project in seed production in the near future.

According to Ms MR Matlebjane, of the provincial Department of Agriculture, Limpopo Province sowed the seeds for

success in seed production a long time before. She says that the motivator for innovation in the seed production sector in the Province was the result of a local farmers' tour to Zimbabwe several years before to learn about small-scale farming and seed production, amongst others. She says farmers were willing to start the project as they wanted to alleviate poverty in their communities. They committed themselves and selected their representatives to participate in the project. Department of Agriculture officials in Limpopo linked these farmers with their research section to continue with training on planting, selection and seed production.

This project received the runners-up award for the Public Sector Innovator of the Year Award from the Centre for Public Service Innovation (CPSI) in 2006.

This publication, CASE STUDY, showcases this success as a case study to share information on public sector innovation and to encourage other innovative projects, particularly in seed production. This success story is described at length in Case 2007/05.

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Background

Food production is one of the priorities of South Africa's Government. Erratic rainfall and drought are recurring problems in southern Africa. This is why the Swiss Agency for Development and Cooperation and the Rockefeller Foundation funded the Southern African Drought and Low Soil Fertility Project (SADLF). This Project involved CIMMYT and agricultural research programmes of the Southern Africa Development Community (SADC) region.

"The SADLF project was initiated in 1996, and now we're seeing the first benefits," says Masa Iwanaga, CIMMYT's director general. Stress-tolerant, open-pollinated varieties (ZM421, ZM521, and ZM621) from the project have been released in Malawi, South Africa, Tanzania, and Zimbabwe, and they are also being used in Angola and Mozambique.

In trial varieties grown from Ethiopia to South Africa in 1999, ZM521 produced an average 34% more grain than other improved varieties that farmers grow.

The community-based seed production project in Limpopo

The Northern Province Department of Agriculture and Environment (NPDAE), in terms of the new South African agricultural policy framework, decided to extend services to smallholders. In 1998 it launched the Broadening Agricultural Services and Extension Delivery Programme (BASED). Researchers, together with farmers, developed sustainable mixed farming systems to improve economic returns while sustaining

food production. Farmers on smallholdings demanded seeds for improved open-pollinated maize varieties (OPVs).

These improved varieties would cope better with drought and low soil fertility when compared to traditional ("local") OPVs. They would store as well, would mature faster, and would meet market requirements for pure white grains. The maize would also taste as good. Smallholder farmers argue that recycling OPV seed carries no yield penalty. The economic returns of improved OPVs over seasons, particularly when the OPVs are grown in harsh environments, may therefore match those of more expensive hybrid seeds.

The problem

Addressing a NSIMA Annual collaborators' meeting in August 2006, Mr Jeff Mkhari said:

In the past in South Africa, the formal seed systems did not meet the needs of small holder farmers, while research for the selection of crop varieties mainly focused on the needs of commercial farmers.

Furthermore, the past seed system activities did not allow small holder farmers to produce seeds.

According to Ms MR Matlebjane, prior to the introduction of the innovative ways of producing seeds, "The officials were not meeting with farmers to identify their (the farmers') needs. Farmers were forced to plant only maize crop and not to intercrop with other legumes like cowpeas. Officers were serving farmers

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identified by them and not servicing those who are ploughing in open fields. There was no event where open-field farmers could meet and share problems. Yield was declining”.

In a nutshell, Mkhari pointed out, the problems that were faced by Limpopo farmers were that the smallholder farmers could not afford the commercial hybrid varieties. Consequently, the farmers were recycling “local varieties” (LVs) of seeds, which had become increasingly non-adaptive to environmental and socio-economic changes.

Farmers needed varieties of maize that were resistant to disease and could be stored. They needed grains that matured early, that are uniformly white in colour, had cobs that cover the tip and tasted similar to local varieties.

Methods, interventions and solutions

CIMMYT, ARC-GCI, SANSOR, NDA-Genetic resources, LDA colleges, Progressing Milling and private seed companies, under the leadership of the Department of Agriculture, met to address the small-holder farmers’ challenges in seed production. These partners met to formulate a strategy. Its objectives, according to Mr Mkhari, were:

- To expose farmers to different seed varieties.
- To enable them to identify preferred varieties according to their own criteria and by using MBTs and VEVO trials.
- To enable farmers to multiply preferred varieties of seeds so as to guarantee local seed security and to make seed production profitable.

The Agricultural Research Council Grain Crops Institute (ARC-GCI) has been testing and registering CIMMYT maize varieties and promoting their use among farmers through community-based seed production schemes and small private seed companies (Jeff Mkhari, Department of Agriculture, Limpopo).

Word about ZM521 and Grace (another new variety) got around quickly and farmers wanted to know how to multiply and maintain the seeds of these OPVs. Under programmes supported by the German Technical Co-operation (GTZ) and the British High Commission, the NPDAE and EcoLink have started to train farmers in seed production. Communities are building up seed stocks.

Recently, 600 packets of farmer-produced Grace seed were supplied to farmers in Mpumalanga and Limpopo in one season. Despite adverse weather 12 farmers produced ZM521 seed on areas of 0.25 hectares or more.

To make this popular seed more widely available in South Africa, it was decided that the Agricultural Research Council Grain Crops Institute in Potchefstroom would register the varieties so that they could be released officially in South Africa, multiplied on a larger scale, and then made available to seed companies, non-governmental organisations (NGOs) and other organisations. The farmers that were trained in seed production are partners in EcoLink Seeds and this new company produced ZM521 and Grace seed in 2001.

The seed processing is done at Madzivhandila

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Agricultural College at Vhembe as it is the only processing unit registered.

Results

- Crown Seeds produced 300 tons of certified ZM521 seed during the 2005/6 season.
- Crown Seeds planted about 100 hectares of each of ZM521, ZM423, ZM523 and ZM623 for certified seed production in the 2006/7 season.
- Crown Seeds supplied certified ZM521 seed to smallholder farmers through community-based stockists, who also act as crop advisors.
- Certification is administered by SANSOR, the national seed-certifying agency.
- There are three projects in the Capricon District Municipality:
 - The Jack Mafarane project, which has 33 members.
 - The Mapeu project, which has ten members.
 - The Mashushu project, which has 20 members.
- There is a new project in Lekgothoane.

One of the pioneers of this seed production innovation, the CIMMYT organisation, foresees considerable success for the innovation:

This work shows that there is considerable scope for success in improving agriculture and rural livelihoods for the poorest farmers in South Africa. Progress can become extremely rapid when partners with many different areas of expertise are highly engaged in making a difference. Through the partnership described here, many farmers have obtained greater control over their circumstances. They can

participate more widely in the selection of the maize varieties they want to grow and have the opportunity of developing an economically viable and sustainable seed production system.

Facts about the seed varieties

According to CMMYIT, the new varieties have several advantages (see Facts about new maize varieties below). ZM521 yields between 30% and 50% more than traditional varieties during conditions of drought and low soil fertility, two problems that usually keep smallholder farmers poor. Farmers also value Grace, the other new variety, because it matures early, is resistant to maize streak virus, is suitable for green maize production and has a very flinty grain type. Their seed will be cheaper than hybrid seed because they are open-pollinated varieties.

Facts about the new maize varieties

ZM521

- It has intermediate maturity: between 60 and 65 days to flowering and between 120 and 130 days to maturity.
- It is a white semi-flint grain with a modest frequency of semi-dent kernels.
- It has high yield even during conditions of drought and low soil fertility.
- It has moderate levels of resistance to maize streak virus, grey leaf spot, common rust and northern leaf blight.
- It is tall, with good lodging resistance and good cob tip cover.

Grace

- It matures early: between 55 and 60 days to flowering and between 110 and 120

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days to maturity.

- It is a white flint grain with high flour yield.
- It is well suited to green maize production.
- It has high levels of resistance to maize streak virus and moderate resistance to northern leaf blight and common rust.
- It is of medium height, with good lodging resistance and cob tip cover.

Source: <http://www.cimmyt.org>

Sustainability of the project

This type of seed production is not time-sensitive but it can be affected by climatic changes which are not yet known. These seed varieties are, however, drought- and disease-resistant.

Mkhari advises that, for sustainable community-based seed production, it is necessary to have:

- The involvement of the different partners throughout.
- Commodity associations.
- Provision of basic seed.
- A seed certification authority.
- Value-adding and market linkages.
- Continuous seed development and evaluation.

The skills, which include training on the breeding of basic seeds for farmers, are also critical for sustainability.

Sustainability will be further enhanced if farmers:

- Are trained by the SADC.
- Are able to share processing with others.

- Have received grants from the Department to build processing structures in their villages.
- Are earning money after selling seeds.
- Are well organised.
- Are able to hold fairs.

Partners in innovation

The Limpopo Community-based Seed Project is a success story. It was made possible by a partnership between many organisations, which include government, communities, non-governmental organisations, international organisations and donors:

South African organisations

- National Department of Agriculture.
- Northern Province Department of Agriculture and Environment (NPDAE).
- Broadening Agricultural Services and Extension Delivery Programme (BASED).
- Lowveld Research Unit (LRU) of the Mpumalanga Department of Agriculture.
- Directorate of Genetic Resources of the National Department of Agriculture.
- Grain Crop Institute of the Agricultural Research Council (GCI-ARC).
- University of the North.
- University of Venda.
- Northern Province Department of Agriculture and Environment agricultural colleges.
- EcoLink Mpumalanga.
- South African National Seed Organisation (SANSOR).
- South African National Research Council.

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International organisations

- German Technical Co-operation.
- British High Commission.
- International Maize and Wheat Improvement Centre (CIMMYT).
- Southern Africa Development Community (SADC).
- Maize and Wheat Improvement Research Network for SADC (MWIRNET), funded by the European Union.
- The South African Drought and Low Soil Fertility (SADLF) Project, funded by SADC.
- Promotion of Small-Scale Seed Production Project by Self-Help Groups Programme for SADC (SSSP).

Lessons learned

There are six main lessons learned from the project. These are:

- There are difficulties associated with introducing something new.
 - It is possible for people to learn new skills.
 - It is important to use familiar language.
 - People's lives can be improved through innovative projects.
 - Team work produces the best results.
 - Resources must be shared.
- Difficulties associated with introducing something new

Ms Matlebajane feels that it was not a smooth learning curve:

It was the first experience in the Department. It

was new to officials, new to the farmers, new to Moshate (a chief in a traditional community) and new to headmen. There was fear of a failure from the officials. We got training from external consultants. We always used the English language for a long period. It was not so smooth.

To mobilize farmers and create awareness of the project innovation was not simple. We sometimes worked until late and over the weekends. It was tough.

The process has to start at the chief and we were supposed to clarify him/her until she/he was convinced and thereafter take it to the community. Then we have to go to the people, hold meetings, and demonstrate. As it was new to us all, it was tough.

- It is possible for people to learn new skills

This project taught people new skills for arid land. These included:

- Methods of planting such as conservation tillage.
 - Using ripper planters to avoid soil erosion.
 - Using Vertivar and Napiar grasses to prevent soil erosion and to control cutworms.
- The importance of familiar language

The English language problem was overcome by translating the farmers' training manual into the three local languages of Northern Sotho, Shangaan and Venda.

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- People's lives can be improved through innovative projects

People's lives were improved, according to MatlebJane, because:

- The farmers received training sponsored by SADC.
 - The farmers are able to share processes with others.
 - The farmers received grants from the Department to build processing structures in their villages.
 - The farmers are making money after selling the seeds.
 - The farmers gained organisational skills.
 - The farmers can now hold information sharing sessions.
 - The farmers know what they need and they participate actively in production.
- Team work produces the best results

People with different skills worked in teams to produce the best results.

- The importance of sharing resources

We need to learn that we live in a global village and that we must share its resources.

Replicability

Ms MatlebJane has suggested a process to follow in order to replicate the project in other organisations or departments.

Managers from interested organisations or departments may need to meet the Head

of Department (HOD) of the Department of Agriculture in Limpopo if they are interested in replicating the seed production project. The Research Manager would also need to be involved in the process as he would organise the team to assess whether it is possible to implement the project elsewhere in the Province.

Similar projects can be initiated anywhere provided there is a willing farming community and proper community facilitation. The project is already being replicated north of South Africa.



Mpumalanga farmers on the bandwagon.
Source: CIMMYT

Conclusion

South Africa needs to be innovative in food production, especially with the inflation in food prices being experienced.

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Acronyms In Case Study

CGIAR	Consultative Group on International Agricultural Research	The CGIAR is a strategic alliance of members, partners and international agricultural centers that mobilizes science to benefit the poor
CIMMYT	International Maize and Wheat Improvement center	Maize and wheat for the developing world: CIMMYT puts cutting-edge science at the service of developing country farmers, offering them better food security and livelihoods through nine flagship products encompassing maize, wheat, research tools, cropping systems, and capacity-building.
NSIMA	The New Seed Initiative for Maize in Africa (NSIMA)	Project has the goal of stimulating the development and delivery of improved maize varieties to farmers in southern Africa. The basic underlying rationale of this Project is that most smallholder farmers are not using improved seeds, and consequently a fundamental constituent of productivity gain is missing. NSIMA is tackling this issue through a number of strategies, beginning with fostering the development of improved and adapted maize varieties through support of National Maize Breeding Programmes in seven SADC countries and funding the breeding activities of CIMMYT-Harare.
ARC-GCI	Agricultural Research Council-Grain Crop Institute	www.arc.agric.za
SANSOR	South African National Seed Organisation.	South Africa's seed industry was established in the 1940's. Consolidation started in 1980 with the establishment of the Association of National Seed Organisations (ANSO). However, as government decided to transfer some of its functions to the private trade, specifically seed certification SANSOR was formed in June 1989.
NDA	The National Development Agency (NDA)	A section 3A statutory organisation, which was established by the National Development Agency Act (Act No. 108 of 1998) in November 1998. The NDA is a public entity listed under schedule 3A of the Public Finance Management Act (PFMA) and reports to the Parliament of the Republic of South Africa through the Minister for Social Development and is mandated to carry out the following: <ul style="list-style-type: none"> • To grant funds to Civil Society Organisations (CSOs) for the purpose of meeting the developmental needs of poor communities; • To strengthen the institutional capacity of CSOs for long term sustainability; • To proactively source funds for the NDA for purposes of achieving its objectives; • To promote consultation, dialogue, and sharing of developmental experiences; • To debate and influence developmental policies; and To undertake research and publication aimed at providing the basis for development policy.
LDA	Limpopo Department of Agriculture	A department of Limpopo government.
NPDAE	Northern Province Department of Agriculture and Environment	Old name for Limpopo Department of Agriculture.
SADC	Southern African Development Community	The Southern African Development Community (SADC) has been in existence since 1980, when it was formed as a loose alliance of nine majority-ruled States in Southern Africa known as the Southern African Development Coordination Conference (SADCC), with the main aim of coordinating development projects in order to lessen economic dependence on the then apartheid South Africa. The founding Member States are: Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.
MBT	Mother and baby trial	Refers to seed variety production trials, done by the department of agriculture and by farmer, mother and baby trials respectively.
VEVO	Variety evaluation for verification and observation	Done by the department in collaboration with farmers.

Acknowledgements

- Centre for Public Service Innovation (2006). Public Sector Innovation Awards, booklet.
- Kristyn Ebro (May 21, 2001). South Africa – CGIAR Partnership Results in New Maize Varieties With 30 to 50 Percent Higher Yields (Press release).
- Mkhari, Jeff, Department of Agriculture in Limpopo (August 2006). Community Based Seed Production (paper) at NSIMA Annual Collaborators' meeting, Benoni, South Africa.
- Matlala, Kennedy (project site guide on 14 May 2007) Department of Agriculture in Limpopo.
- MatlebJane Mina, Department of Agriculture in Limpopo (May 2007). Response to CPSI questionnaire.
- http://www.cimmyt.org/whatisimmyt/recent_ar/D_Support/drought.htm
- <http://www.africancrops.net/news/march07/nsima/cimmytOPVs.htm>
- Mpofu Bella (2000). Assessment of seed requirements in Southern African Countries ravaged by floods and drought, 1999/2000 season. SADC and GTZ.
- The seed industry (2005). www.nda.agric.za/docs/cropestimates/
- SADC Seed News, Issue no. 4, 2004. SADC Security Network. Zimbabwe.
- www.arc.agric.za



Centre for Public Service Innovation (CPSI)

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Tel: +27 12 672-2825 • Fax +27 12 672-1321 • email: cpsi@sita.co.za

www.cpsi.co.za