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Bioversity International is a global research-for-development organization. We have a vision – that agricultural biodiversity nourishes people and sustains the planet.

We deliver scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security. We work with partners in low-income countries in different regions where agricultural and tree biodiversity can contribute to improved nutrition, resilience, productivity and climate change adaptation.

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The Department of Agriculture, Forestry and Fisheries (DAFF) is a national sphere of the South African government responsible for implementing the laws and policies decided by the South African parliament. It specifically derives its core mandate from section 27 (1) (b) and (2) of the South African Constitution which is to: “...take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of the...right (of everyone) to have access to sufficient food.” Within the DAFF and more specifically the Agricultural Production, Health and Food Safety Branch of the DAFF, the Directorate Genetic Resources is mandated to regulate and provide an integrated national management system in support of the conservation and sustainable use of genetic resources for food and agriculture. This involves the development and implementation of policies, legislation, strategies and norms and standards on the management of genetic resources for food and agriculture, the regulation and promotion of propagating material of genetic resources for food and agriculture and to provide for a risk mitigating system in support of agricultural biodiversity.

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Front cover (top: inspecting the first accessions of the Gumbu community seedbank; bottom: the first collection of the Sterkspruit community seedbank) and inside photos: Ronnie Vernooy.

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1. Introduction

South Africa's smallholder seed systems are increasingly coming under pressure. Factors such as drought, crop failure, difficult storage conditions and poverty, are having a negative impact on both the amount of seed and the number of plant varieties available to farmers. In addition, as a result of agricultural modernization, farmers are increasingly purchasing more seed of modern varieties and losing locally adapted varieties along with the associated traditional knowledge and skills in selection and seed storage. Forms of traditional seed exchange among farmers can still be found, but their strength seems to be diminishing.

To turn this tide, the Department of Agriculture, Forestry and Fisheries (DAFF) of the Government of the Republic of South Africa is considering community seedbanks as a means to strengthen informal seed systems, support conservation of traditional farmer varieties and maintain seed security at district and community levels. The most recent *Departmental Strategy on Conservation and Sustainable Use of Genetic Resources for Food and Agriculture* proposes, among other focus areas, both *ex situ* and *in situ* conservation of plant genetic resources for food and agriculture.

South Africa has a well-developed *ex situ* conservation facility, the National Plant Genetic Resources Centre (NPGRC), where accessions of plant material are maintained. The centre's mandate has recently been extended to include community seedbanks as a strategy to promote on-farm management and conservation of traditional crops. To fulfill this mandate, NPGRC considers capacity development of its technical staff an important step. Technical staff will be better equipped to work with farmers to strengthen informal seed systems, support the conservation of traditional farmer varieties and maintain seed security. In 2013 NPGRC joined forces with Bioversity International to develop a national plan for the establishment and support of community seedbanks. Considering that Bioversity International has been working with community seed banks of all kinds in countries around the world, NPGRC invited Bioversity International researchers to advise how to implement its conservation strategy. Previous efforts to establish community seedbanks in two of the country's smallholder areas initiated by civil society organizations with the technical support of NPGRC had not been successful (Vernooy et al. 2015).

2. From assessment to action

Following an in-depth community assessment of trends in agricultural biodiversity conservation and use carried out in 2013, the organizational process of establishing a community seedbank in two farmer smallholder areas was started: Gumbu village in Mutale municipality in Limpopo province (photo 1; all photos can be found on pages 4-5) and Sterkspruit town of Joe Ngcabi municipality in Eastern Cape province (photo 2) (Vernooy et al. 2015). Farmers in both regions live and work under tough conditions including: low rainfall levels in both sites, cold and windy weather conditions in the mountainous areas in Eastern Cape, and poor accessibility to and distance from major markets in both sites. Yet, they still manage to make a living. They produce food mostly for subsistence but also succeed in producing small surpluses which they market locally. Crop and varietal diversity combined with diverse animal husbandry practices (cattle, sheep, goats) are central to their farming systems and to survival. However, in the last few decades, several crops and crop varieties have disappeared or seeds have become hard to obtain. Increasingly fewer options are available to cope with environmental variability (Vernooy et al., 2013). Farmer seed networks in both sites appear to be weak with few and infrequent exchanges of seeds. At the same time, farmers have very weak links with the formal seed sector. Accessing new crop diversity represents a serious challenge.

In both regions farmers rely on different combinations of a few major crops grown in large areas by most households (white and yellow maize, white sorghum, millet and groundnut in Limpopo) and on a larger number of crops grown in small areas (pumpkin, squash, beans, cowpeas, potatoes, melon, calabash, tobacco and many fruits and vegetables in Limpopo). The major reasons for maintaining diversity given by farmers (women and men) are: good taste and nutrition-dense (the word farmers used is “powerful”), easy to combine in the preparation of traditional dishes, drought resistant, resistant to pests and diseases, short growing cycle, low input, long-term storage capability, heritage, and intercropping. In Limpopo, some farmers have been able to purchase simple drip irrigation technology to produce vegetables for the market.

In 2014, the main activities carried out to support the establishment process in both sites included an analysis of the existing household and community practices of seed storage and identification of their strengths, weaknesses and opportunities for improvement; a discussion with farmers about how to organize an effective and sustainable community seedbank; the celebration of local crop diversity through the organization of a food fair (food fairs are new in both sites) (Maluleke et al. 2014). Based upon consent obtained from

all the participating farmers, traditional food recipes were collected during the food fairs and published in a tri-lingual booklet in 2015 (Maluleke et al. 2015). Farmers were very pleased to receive recognition for maintaining and sharing traditional dishes. Each of the participants of the food fairs received a copy of the booklet from DAFF.

3. Gumbu community seedbank

The Gumbu village community seedbank is managed and operated by a group of 20 women farmers, who give priority to nutritious crops and varieties with good taste that are easy to combine in preparation of traditional dishes, require few inputs, are drought, pest and disease resistant, and have a short growing cycle and long-term storage quality. The women contend that the community seedbank will allow them to maintain a range of different crop species and varieties inherited from their parents, support their households in terms of food supply, and also give them satisfaction and allow them to earn some extra cash. They also remarked that exchange of seeds amongst farmers from different communities and cultures will help to stop the loss of crop diversity that is occurring in the area.

4. Sterkspruit community seedbank

The Sterkspruit 'community' seed bank represents a district-level community seed bank in which farmers from the villages of Jozana, Ndofela, Phelendaba, Qhoboshana, Voyizana and Ximegha are the active members (the villages are located within a radius of 30 kilometers from the town of Sterkspruit in the table-mountains typical of the Eastern Cape). It is foreseen that in the coming years, farmers from other villages in the district will join. The community seed bank builds upon the efforts of another farmer organization that has been operating in the area for some years. This farmer organization owns a meeting facility that is constructed on a large piece of land in the town of Sterkspruit. The temporary community seed bank facility is located on the same piece of land. There are about 15 active community seed bank members, all experienced women and men farmers who have been living in this part of Eastern Cape for considerable time. They all have a strong interest in maintaining and where necessary, improving traditional varieties.

Photos 1-4: Gumbu; area surrounding Sterkspruit; Gumbu farmers vote for the establishment of a community seedbank; Sterkspruit management committee



Photos 5-8: first contributions Gumbu; labelling Sterkspruit; land for the Gumbu community seedbank; temporary building Sterkspruit



5. Technical and organizational capacity development

In 2015, farmers in both sites received training in community seedbank management (technical and organizational aspects including seed registration) and were introduced to the concept and practice of participatory crop improvement. Farmers expressed a strong interest in learning about participatory crop improvement and exploring a practical way to try it out. Bioversity International staff agreed to develop a plan for 2016 to start a small-scale improvement experiment in Gumbu and Sterkspruit. Throughout the year, we paid special attention to facilitating the organizational development process of the two community seedbanks, with particular attention to local power and gender relations. We facilitated open discussions in which all farmers present had a chance to speak out and deliberate about suggestions made. We allowed farmers to make their own decisions while making sure that all opinions were considered and nobody felt to be marginalized or left out (photos 3 and 4).

We strengthened the connection between the local communities and the agricultural extension services in both sites and made a start with the design of a capacity development strategy for extension agents across the country to be rolled out in 2016.

Farmers in both sites contributed seeds for the very first collections of their community seedbanks. Seeds were checked for quality, labelled, documented and then stored (photos 5 and 6). In Sterkspruit, a temporary facility was established and a plan made for the construction of an appropriate permanent physical structure for the district level community seedbank. In Gumbu, a plan was developed and approved to build a new physical structure on a piece of land donated by the village headman and with funds provided through the collaborative agreement between DAFF and Bioversity International. Preparations for construction began in the autumn and would culminate in the inauguration of the new community seedbank in March 2016 (photos 7 and 8).

Governance and management

The various meetings in Gumbu and Sterkspruit were attended by farmers, local agricultural extension agents and DAFF staff. Farmers first reiterated the various functions of their community seedbanks: in both sites the main functions include conservation of traditional varieties, halting further genetic erosion and bringing back some of the varieties that had disappeared from the areas, sharing diversity with farmers at village and district levels, and adding value to local crop diversity through activities such as seed and food fairs, production and sales of seeds, and participatory crop improvement. They also discussed

what kind of governance and management structures would be appropriate for their community seedbank to guarantee efficient and effective operations. In both sites, farmers agreed to have a committee made up of a chairperson, vice chairperson, secretary, vice-secretary, treasurer and two additional members. Based on interactions among the farmers, members of the first committees were elected. In Sterkspruit, the farmers elected a committee of three women and four men farmers; in Gumbu, all the members elected are women.

Farmers further deliberated about membership and membership administration. In Gumbu, farmers agreed that they would welcome any farmer in the community seedbank who wants to be a member, especially young people. In order to be a member one must be a farmer who is actively involved in farming. Membership administration begins through the donation of at least one amount of seeds. Where someone has no seeds to contribute from their own harvest, a small amount of seeds should be purchased from another farmer and deposited in the community seedbank. After the first donation, the rule agreed upon is that seeds can be borrowed from the community seedbank in return for one-and-a-half times the amount borrowed. The Gumbu farmers also agreed that farmers from other villages not initially involved in the establishment of the community seedbank would be welcome as members on condition that they contribute seeds as per the above rules. However, the Gumbu farmers expressed that they would give priority in the first year to farmers of their own village. The groups of farmers present at the meetings defined some additional rules: i) it would be ideal if a new member could contribute at least 500g of seeds [this was clearly formulated as an ideal; farmers were well aware that at this moment in time this would nearly impossible to realize for any of the farmers in the community]; ii) the community seedbank should never hand out all its seeds; iii) the community seedbank will be managed by the farmers but welcomes regular monitoring by the NPGRC and Bioversity International staff.

Seed registration

Committee members learned about the use of an accession passport data registry to maintain a concise record of the seeds coming in to and going out of the community seedbank. They received an example developed by NPGRC and Bioversity International staff in the form of a notebook. The registry includes the name of the farmer, the date of deposit/withdrawal, the crop name, the variety name if known, and the amount of seed deposited/withdrawn. The secretaries of both community seedbanks practised the use of the registry when recording the very first set of accessions handed over to the community seedbanks during the year. In Gumbu the passport data registry was recorded, but seeds

could not be stored in 2015 as the community seedbank had yet to be constructed (one of the farmers maintained the first set of accessions in her house for the time being). In Sterkspruit, a passport data registry of all the seeds brought by farmers was compiled and the seeds were stored in the temporary community seedbank. Farmers in both sites stored seeds in the airtight plastic bottles donated by NPGRC.

Seed selection, treatment, storage and maintenance

Farmers received guidance in proper seed management including seed selection, seed cleaning and treatment (e.g. fumigation), seed quality control, weighing (in both sites, farmers received a simple electronic scale and learned how to use it), cleaning of containers, labelling of containers and storage. They also received some practical tips to maintain the seed storage facility in good order. As much as possible seed management practices used in the community seedbanks are building on farmers' traditional knowledge and practices. Where appropriate, farmers will learn about innovations that have been developed by scientists and/or farmers that operate community seedbanks in other countries, such as, for example, the use of silica beads to improve storage conditions (a new technology being tested for community seedbank management in India and Nepal).

The first collections

During 2015 the members of the two community seedbanks put together the first seed collections. In Gumbu, the collection includes the following crops: Bambara groundnut, bean, calabash, cowpea, finger millet (locally known as Mufhoho; only a few farmers are maintaining this crop), maize (red, white, yellow; only a few farmers are maintaining red maize), melon, mung bean (only a few farmers maintain this crop), moringa (*Moringa oleifera*, locally known as muringa), pearl millet, pumpkin, sorghum and sweet sorghum, and water melon. Farmers made the largest number of contributions of maize (not surprisingly given that this is the number one staple crop), pumpkin, water melon and "wild" bean (we have yet to properly identify this bean variety).

In Sterkspruit farmers offered the following crops: Bambara groundnut, bean, cowpea, maize (red, white, yellow), melon, pea (also known as erwtje), pumpkin, sorghum and sweet sorghum (very few farmers are maintaining sorghum varieties), water melon and wheat (only a few farmers maintain this crop). Farmers also brought a (small) local potato variety, but it was decided that they would maintain this crop in their own field (field genebank). The first collection in the Sterkspruit community seedbank represents less diversity (and has also

fewer contributions) compared to Gumbu which reflects the current farming systems in both sites.

6. Next steps

A promising start has been made: the two new community seedbanks of Gumbu and Sterkspruit and complementary technical support provided by the government will allow farmers to improve seed conservation technologies, increase access to crop diversity, apply crop improvement practices and explore seed production and marketing opportunities. Farmers in both sites face the challenge of adaptation to climate change –an issue that so far has not received adequate attention from development and research organizations in the country. The Gumbu community seedbank in particular illustrates the key role of women farmers in local conservation efforts and how these efforts in turn have the potential to change the local agro-ecological and socio-economic landscape. We will continue to pay attention to the successes and challenges of such farmers' efforts and continue to draw more attention and support to: encourage the safeguarding and improvement of local plant species and varieties maintained by smallholder farmers and their communities recognizing the central role of women; value and reward farmers' collective efforts to safeguard and improve agricultural biodiversity and associated cultural values and knowledge; and support farmers technically and financially to organize themselves, and strengthen their organizational capacity taking into consideration the leadership role of women (Vernooy 2015).

The vision for the future is to have a strong national network of community seedbanks that work together with the NPGRC under the Department of Agriculture, Forestry and Fisheries, in collaboration with other formal sector organizations, such as the national and provincial agricultural extension service, crop improvement stations and universities and with civil society organizations. Central to the effective implementation of this strategy will be the involvement and training of extension agents in all the country's provinces, the further capacity development of DAFF staff and the strengthening of collaboration between community seedbanks and DAFF. Farmers of Gumbu and Sterkspruit will train other farmers in efficient and effective community seedbank governance and management.

Publications 2013-2015

Blogs

<http://www.bioversityinternational.org/news/detail/powerful-crops-empowering-farmers-through-community-seed-banks-in-south-africa/>

<http://www.bioversityinternational.org/news/detail/supporting-community-seedbanks-in-south-africa/>

<http://www.bioversityinternational.org/news/detail/seed-savers-of-gumbu/>

http://www.tandf.net/energy/articles/strengthening_local_level_seed_access_and_availability_of_crop_diversity/

<http://www.we.expo2015.org/en/news/womens-seedbank>

<http://www.bioversityinternational.org/news/detail/gender-and-climate-change/>

Books and book chapters

Maluleke, N.L., Moila, P., Phora, G., Dibilane, M.A., Vernooij, R., Sthapit, B. (2015) *Indigenous food recipes*. Department of Agriculture, Forestry and Fisheries–Directorate: Plant Genetic Resources, Pretoria, South Africa. [not available on-line]

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<http://www.bioversityinternational.org/e-library/publications/detail/community-seed-banks-origins-evolution-and-prospects/>

Briefs

Vernooij, R. 2015. Seeds of adaptation: climate change, crop diversification and the role of women farmers. Gender climate brief 1. Center for International Forestry Research (CIFOR), Bogor, Indonesia. Available:

<http://www.cifor.org/library/5896/seeds-of-adaptation-climate-change-crop-diversification-and-the-role-of-women-farmers/>

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Vernooij, R., Sthapit, B., Tjikana, T., Dibilane, A., Maluleke, N., Mukoma, T. (2013) *Embracing diversity: inputs for a strategy to support community seedbanks in South Africa's smallholder farming areas*. Bioversity International, Rome, Italy, and Department of Agriculture, Forestry and Fisheries, Pretoria, South Africa.

<http://www.bioversityinternational.org/e-library/publications/detail/embracing-diversity-inputs-for-a-strategy-to-support-community-seedbanks-in-south-africas-smallholder-farming-areas/>

Maluleke, N., Moila, P., Phora, G., Dibilane, A., Vernooij, R.; Sthapit, B. (2014) *Savouring diversity: first steps in implementing a strategy to support community seedbanks in South Africa's smallholder farming areas* Bioversity International, Rome, Italy, and Department of Agriculture, Forestry and Fisheries, Pretoria, South Africa.

<http://www.biodiversityinternational.org/e-library/publications/detail/savouring-diversity-first-steps-in-implementing-a-strategy-to-support-community-seedbanks-in-south-africas-smallholder-farming-areas/>

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