



Seed Fair in Zimbabwe, Photo: Shepherd Tozvireva/Oxfam Novib

OUR SEEDS: LESSONS FROM THE DROUGHT

Voices of farmers in Zimbabwe

Zimbabwean smallholder farmers consider seed security to be an issue of national security. For them, access to the right seeds at the right time, and for the right price, is critical to being able to produce enough food to eat in the face of growing climate disruption. Farmer seed systems and community seed banks provide an important safety net for cash-strapped, vulnerable people. They also help small-scale farmers manage climate risk. Supporting them is an adaptation opportunity that is currently being missed.

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INTRODUCTION

Zimbabwean smallholder farmers consider seed security to be an issue of national security. For them, access to the right seeds at the right time, and for the right price, is critical to being able to produce enough food to eat in the face of growing climate disruption.

Farmer seed systems provide this seed security:

- The right seeds: the only way smallholders can access crops which are not prioritized by the private sector, but which are locally adapted, resilient to drought and important for household food and nutrition. These tend to be women's crops.
- The right time: locally available farmer seed means that farmers can access what they need quickly – important in the current context of shortages in the formal seed sector, and if farmers are forced to plant early or replant to react to unpredictable weather.
- The right price: farmer seed systems provide low-cost seed for smallholder farmers who cannot afford to make recurrent purchases of hybrid maize seed every year, plus the even more expensive package of chemical inputs required to unlock their yield potential. They are an important safety net for vulnerable communities during the worsening economic situation, and are a lifeline for smallholder farmers with limited resources.

Community seed banks are a way to strengthen farmer seed systems. As seen in one district during the recent devastating drought, a strong farmer seed system was the difference between smallholder farmers harvesting something or nothing at all. This report conveys the voices of farmers who depend on the seed bank and the related farmer field school programmes they operate and manage together with Community Technology Development Trust (CTDT).

Beyond helping communities to weather shocks in the short term, farmer seed systems are a broader public good: they provide reservoirs of plant genetic resources that are needed in the longer term to adapt agriculture to climate change, pests and diseases.

Adapting the agricultural sector to climate change is a major priority for the Zimbabwean government as set out in their Nationally Determined Contribution (NDC) to the Paris Agreement on Climate Change. The upcoming National Adaptation Plan will set out needs, costs and actions. Investing in seed systems which respond to the changing needs of smallholder farmers is exactly the kind of thing that will help meet the country's climate change adaptation goals. It is also a step towards achieving the UN Sustainable Development Goal of zero hunger by 2030. However, it is an opportunity that is currently being missed. Government policy is overly focused on protecting and supporting formal seed systems and seed companies. More can be done to balance this policy framework with farmers' rights to save, exchange, multiply and sell farm-saved seed.

WHAT IS AT STAKE: THE CURRENT HUNGER CRISIS

Zimbabwe, like other countries in the region, is in the grips of an escalating hunger crisis – after drought-crippled harvests in the 2015/2016 agricultural season. The drought was brought on by a combination of one of the strongest El Niño episodes on record combined with climate change – and it is the latest in a series of back-to-back droughts which have severely tested the resilience of the country's smallholder farmers, reliant on rain-fed agriculture. The drought has exacerbated underlying chronic problems like underinvestment, which mean that even in the best of years, the small-scale farming sector remains in a poverty trap.

This year's hunger season – the period between harvests when food stocks become depleted – will be much longer and harder than usual. As it reaches its worst point, around January to March, more than four million people – or 42 percent of the rural population – are expected to be in need of food assistance. Meeting their immediate humanitarian needs remains the imperative, and all actors must urgently provide food and other assistance.¹

Now, in the midst of the planting season, the El Niño episode is swinging to its opposite 'La Niña' stage, which is normally associated with extreme rains and floods. Yet the picture is mixed for Zimbabwe: normal to above-normal rain is forecast for the first half of the season, while as the season progresses, normal to *below*-normal rains are forecast for the more arid south.² In all cases, there is a need to help struggling communities plant successfully, as, following the failed harvests (and combined with the liquidity crunch), many farmers have no money to buy seed and fertiliser. Humanitarian agencies in the region have warned that many farmers lost their own seed stocks in the drought, either because they consumed the seed they had saved to plant, or because the crops which they intended to harvest and save their seed from were devastated by drought.³

What are farmer seed systems?

Farmer seed systems include farmer-saved seed, farmer-to-farmer exchange and local seed fairs. They are sometimes called informal seed systems – although this can be seen as a demeaning term. It generally refers to local systems where farmers select, multiply and distribute their own seed. Community seed banks are a way of reinforcing these systems. Farmer seed systems are the dominant seed system and constitute the backbone of agricultural production in many parts of the world, including Zimbabwe. A detailed 2009 study showed that for everything other than maize, farmers in Zimbabwe rely on their own or each other's seed for 95 percent of the seed they sow.⁴ This year's ZIMVAC survey shows a similar picture – for small grains and indigenous crops like cowpeas and groundnuts, farmers relied on their own seed; whereas for maize, the biggest source was purchased seed, with government hand-outs the second biggest source.⁵

The other system is the formal seed system – where the private sector operates within a supportive framework created by the public sector. The main actors are a handful of big seed companies which develop seeds which are sold through well-developed and often subsidized distribution channels, including large agro-dealers. This system focuses on protected, high-yielding varieties (mainly maize and cotton). In the case of maize, these are overwhelmingly hybrid seeds, dependent on expensive inputs to reach their full potential and which are not much good for re-use, as they lose their hybrid vigour for the next planting.

The two systems co-exist and need to complement each other. The formal system is tailored towards large-scale, intensive farming of commercial crops. The farmer seed system is an important safety net for cash-strapped smallholders who cannot afford to purchase seeds every year, or the accompanying package of fertilisers and pesticides needed to guarantee high yields (especially if the markets for their produce do not function well and they cannot be guaranteed high prices). Farmer seed systems also fill a gap in the market for crops which are less profitable yet play an important role in shoring up household food and nutrition security and contributing to crop and varietal biodiversity – these tend to be crops which women are responsible for growing.



Farmers display their local seeds at a seed fair in UMP District, Zimbabwe, September 2016.

GROWING DISRUPTION

The current drought – although particularly severe – is not a one-off. As climate change takes hold, drought will likely become the ‘new normal’ – and worse, a certainty in some areas of the country according to Zimbabwe’s Nationally Determined Contribution (NDC) to the Paris Agreement on Climate Change:

‘Probability of years in which the growing season is likely to fail in the future due to drought is projected to be as high as 100% in some parts of the southern region.’

Increased climate variability is already a reality. In Zimbabwe, the rainfall patterns have shifted, probably due to climate change. The growing period has shortened: whereas the season used to start in October and last until April, now it can start as late as December and end in February. Farmers in Zimbabwe used to give names to the rains in line with the major seasonal activities, but this doesn’t happen now as rains are no longer regular. The distribution of rainfall has also changed: plants germinate and then wilt as a result of mid-season dry spells, so farmers need to plant again. Maize – the staple crop on which some communities depend for around 90 percent of their calories – is particularly sensitive to moisture during certain phases of plant development. Dry spells at the critical time in the growing cycle mean no harvests – so no food and no income.

Zimbabwe’s adaptation challenge

The scale of the challenge is huge: to adapt to climate change, farmers will need to transform what and how they produce. This will require a major upscale of investment – which must start with reversing the current under-capitalization of smallholder agriculture in Zimbabwe. The country’s Nationally Determined Contribution (NDC) made as part of the Paris Agreement puts adapting the agricultural sector as the highest priority. It estimates that the agricultural sector will need over \$2bn a year between now and 2030 to adapt to climate change and reach its potential.⁶ In comparison, annual government spending on agriculture has recently been estimated at \$0.15bn – and most of this is for subsidizing maize seed and maize prices, rather than for investment.⁷ This represents four percent of the overall national budget, which is far from the 10 percent that Zimbabwe has re-committed to along with other African governments under the 2014 Malabo Declaration. Investments which support smallholder farmers are sorely needed, including early-warning systems; improved water management including irrigation; expanded agricultural extension services; and research and development – especially into small grains and legumes which are adaptive to semi-arid areas – coupled with corresponding technology for processing and value addition.

Seeds and climate change

Since the last major El Niño drought in 2009, Oxfam Novib and CTDI have been working with smallholder farmers – mainly women – to strengthen farmer seed systems in more than 10 marginal⁸ districts of the country through their community seed-banking, seed and food fairs, and farmer field school programmes.⁹ The evidence collected in the framework of that programme gives a picture of farmers’ strategies to cope with climate change.¹⁰

- Farmers are **adopting other varieties or even other crops** which are better adapted to the new weather conditions.

In marginal districts of the country, farmers are opting to diversify away from maize and towards more drought-tolerant alternatives such as indigenous small grains. Farmers in the farmer field schools are prioritizing small grains and legumes (like sorghum, pearl millet, cowpeas and groundnuts) – often reviving or reintroducing old and forgotten varieties as they are better adapted to dry circumstances. Similar trends can be seen over the country as a whole: this year's ZIMVAC shows that farmers took a visible step towards small grains in the arid regions where they knew they would be badly hit by the drought. In one of the most arid regions (Matabeleland North), small grain production actually overtook maize production this past season.¹¹ Yet, maize production continues, including from hybrid seed, as it is the current staple food in the country. Also, in many instances, farmers have little opportunity to diversify production as maize seed and fertilizers are provided to them by government and by NGO drought relief programmes.¹²

- Farmers are also **planting a combination of crops and varieties per crop** to spread risk.

For example, farmers deal with unpredictable rainfall and pests by combining early maturing seeds with late maturing seeds to spread the risk of crop failure. Even if the late maturing variety fails under water stress conditions, those that mature earlier might still thrive should good rains fall in the first half of the season. They are also opting for varieties that are more drought tolerant, i.e. able to reach maturity with very little rainfall, and pest resistant. Farmers like Ms Nyarai Nekate in CTD's farmer field school in Goromonzi district, who reports planting seven corn varieties, seven bean varieties, seven Bambara groundnut varieties, nine cowpea varieties and eight groundnut varieties.¹³

- During drought years, farmers can be forced to **replant two to four times** (using two to four times the amount of seed at several times the cost).

Even if there are initial rains which trigger planting, when mid-season dry spells are combined with warmer temperatures, the effect of any initial rains is quickly lost and crops fail to get properly established – so farmers have to start again. Accessing sufficient seed for replanting is particularly challenging in contexts of back-to-back drought – as farmers had reduced harvests from which to select the seed for the following season. During this past El Niño year, CTD reports that those farmers who had access to community seed banks could replant up to three or four times.

THE ROLE OF FARMER SEED SYSTEMS

In all these coping mechanisms, access to the right seed at the right time and at the right price is critical. Farmers are often limited, as the diversity of good quality seeds needed under the new weather conditions may not be available in their communities nor easily accessed from outside. As the government's Agritex Crop Specialist for Mudzi explained:

'The farmers here still commit most of their land to maize... It's difficult to get good quality sorghum, pearl millet seed and even groundnut seed each season. Sometimes cowpea seed is available with the agro-dealers but still the supply is not what we would want to see. Most of the sorghum seed and pearl millet that farmers use is through [farmer to farmer] exchange. So we need to have a vibrant market of small grain seed here, and that can help us persuade the farmers to switch to the small grains that give us high yields.'

Government can do more to support farmer seed systems

Despite the farmer seed system and the formal seed system complementing each other, government support and regulation is skewed in favour of the commercial seed system. The Plant Breeders Rights Act and the Seed Act restrict the ability of smallholder farmers to sell and exchange their own seed – suffocating local markets, even though these seeds would not otherwise be available, as seed companies are generally not interested in selling non-maize, non-hybrid crops and varieties.

To sell their own seed beyond a limited radius, farmers must go through a complicated and expensive registration and certification process – during which they have to prove that the variety in question is novel and distinct, uniform and true to type, and stable over a number of seasons. This requirement was developed for large-scale farming, but is a major barrier for small-scale farmers.

Only three certified varieties of sorghum were released in Zimbabwe from 2011 to 2013,¹⁴ and at the time of writing, the main seed company in Zimbabwe, SeedCo, only stocked three varieties of small grains, three varieties of groundnuts and one cowpea variety.¹⁵ Yet the latest government monitoring from August showed that *in practice*, no small-grain seed was available from agro-dealers in any of the five regional centres surveyed, and groundnuts and cowpeas were available in one place only.¹⁶ Farmer seed systems plug a gap in the market for less commercially attractive crops – as they provide the only way for farmers to get hold of these seeds.

Community seed banks give farmers affordable access to a wide range of quality seeds which have been improved through farmer selection over the years. Farmers from the farmer field school in Chiredzi district say that one of the reasons they prefer open pollinated varieties of indigenous crops (as opposed to hybrids) is that the seed is cheap and readily available, since farmers save their own seed and store it safely in the community seed bank.

Further, farmer seed systems provide reservoirs of plant genetic resources that farmers will need to continue to adapt to climate change in the future. Farmers surveyed from the farmer field schools look for certain traits that they need to adapt to local conditions – primarily high-yielding, drought-tolerant and early maturing varieties. Women have traditionally been more involved in seed

selection and conservation – so farmer seed systems should be further supported to allow women in particular to take control of their own livelihoods and select and develop their own improved seeds. With support – such as continuous access to new plant genetic materials from, for example, research and plant breeding institutions – this seed improvement process has enormous potential and could be massively accelerated. The CTDI programme is successfully facilitating access to seeds within and between local communities, and linking smallholder farmers with the Crop Breeding Institute of Zimbabwe, private sector institutes and international crop research centres (namely ICRISAT and CIMMYT, two CGIAR centres which are very active in developing new varieties of their mandate crops).

Left to the private sector alone, small-scale farmers in Zimbabwe are likely to be left to wait a long time for the research and development into the kinds of improved heat- and drought-resistant crops and varieties that they need. The commercial seed industry can play a part, but it has concentrated on the more profitable markets which are simply out of reach for the majority of small-scale farmers. If smallholders can access everything needed to unlock the higher yields and higher profits from hybrid seeds (including irrigation and the accompanying package of chemicals) then they may be better off – but if they cannot, they are likely to be better off with their good quality and lower-cost seed systems.

There are costs involved with setting up community seed banks and there is much more that government should do from the extension services and research side to support these structures. Seed banks, especially in the early years, need expert support to check the germination status of seeds and make sure they are rejuvenated when needed to maintain their high quality. There is a role for government extension workers in these tasks.

VOICES OF FARMERS

On 22 September 2016, CTDI and Oxfam organized a 'Climate Hearing' during a seed fair at UMP Community Seed Bank, giving farmers a platform to speak directly to decision makers on how they had been impacted by the El Niño drought and to make the case for the kind of support they need to adapt.

Testimony from Dorroth Chiota-Nzirawa, Kagwede Village, UMP



'My name is Dorroth Chiota, I am a farmer from UMP. We receive less rain in this area because we are in natural region V. In the previous years we used to plant hybrid maize seeds, but due to climate change our yields for maize are now low compared to yields from small grain seeds such as sorghum, *rapoko* [finger millet], cowpeas and pearl millet, since they produce a good harvest.

'[...] in this area, we are now mainly growing crops such as sorghum and finger millet which go a long way in meeting our needs, especially our health, and which are less expensive to produce. This is unlike other hybrid crops such as maize which would require us to source the seed at a high cost. With small grains we can exchange seeds with other farmers [...] it allows for effective exchange during this seed fair and we do not incur high costs to access this seed as compared to purchasing hybrid maize seed.

In the recent past, people used to refer to the food from small grains as traditional foods but as for us, we regard this food as a staple and we want the children here to know that this is our food which is nutritious, healthy and is adaptable to the conditions in our region in view of climate change. We are encouraging fellow farmers to grow small grains.

'[...] our small grains are a domain for mostly women – we are the producers and sellers of the grain, yet we have a problem with the market system for small grains, including market places to sell our produce. Our plea to government is that we require an effective market system for the small grains, just as there is a well-established market system for maize. We would require even our supermarkets to sell small grain seeds – just as they are selling other seeds. We want our supermarkets to be able to sell sorghum, millet and cowpeas seeds and a variety of other small grain seeds [...]. We are all encouraged to grow small grains going forward because we are assured of getting a harvest from them. Forward with growing small grain seeds, forward! And down with hunger, down!'

Testimony from Marjory Jeke, Chadenga village, Murehwa.



'As farmers we used to sell crops and send our children to school or even buy livestock without any challenges. We have been affected by climate change: there have been inconsistent rainfall patterns and we have lost hope because our yields have deteriorated.

We, the farmers, are appealing to the government to assist us in preserving our seeds – rural smallholder farmers are often recycling seeds for more than six consecutive seasons and this compromises our yields. We also need support in accessing markets like the Grain Marketing Board to sell our small grains. If we can access these markets and have approved market prices [so-called gazette prices] we can sustain our families. We are currently doing barter trade because the markets are not working.'

HOW DID LOCAL SEEDS PERFORM DURING THE DROUGHT?

Spotlight on UMP district

The 2015–2016 El Niño-induced drought was one of the worst for decades, and all crops were badly affected.

Using evidence gathered from CTD T's farmer field schools, this report looks at the difference that strong farmer seed systems made during the drought in UMP district, compared with the status quo. Given that the data involves only one cropping season, it does not pretend to be a comprehensive systematic analysis, but rather gives a snapshot of the situation in just one of the many marginal, drought-vulnerable districts of Zimbabwe, where data is available.

It shows that while hybrid maize harvests for the district as a whole were a complete write-off, farmers who had access to community seed banks, combining traditional and modern varieties, were able to at least harvest something using seeds from their community seed bank

On average, small grain yields from farmer field schools were six times higher than the district-wide yield for hybrid maize. This is despite the fact that maize, with its large grains, usually yields more than smaller grains. According to Agritex, the hybrid maize yield for the district was 0.1t/ha, while analysis from CTD T shows that small-grain yields (sorghum and pearl millet) were 0.6t/ha. While these small-grain harvests were still a fraction of what would normally be expected, farmers could at least produce some food for some months despite the worst drought in 20 years

This was due to several reasons. Small grains like sorghum and pearl millet are able to rejuvenate and re-establish themselves from tillers, but maize does not have this capacity. When the rains fell in January, small grains were able to recover thanks to an indeterminate growth characteristic that allowed them to rejuvenate and re-grow after having been earlier destroyed to the ground; a scenario that is not possible with maize.

In addition, farmers used early maturing varieties of small grains – those which were accessible locally through the community seed bank and from public research centres. Some farmers chose to re-plant for the third time to take advantage of the late rains - and the low-cost availability of seed through the community seed bank made multiple sowing operations possible.

These findings confirm that strengthened farmer seed systems can provide a safety-net to smallholder farmers – one that will be increasingly needed as drought becomes the new normal.

RECOMMENDATIONS

We call on the Government of Zimbabwe to:

1. Recognize and support the complementary role that farmer seed systems play by:

- Developing an integrated seed sector approach that also gives a space to farmer seed systems. The government should seek to align with the recently agreed FAO Voluntary Guidelines on Seed Policy.¹⁷ An inclusive seed sector will help to advance the economy while also alleviating poverty among smallholder farmers.
- Hastening the Farmer Rights Bill, including the right to save, exchange, multiply and sell farm-saved seed as articulated in Article 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture under the auspices of the FAO.

2. Provide technical and financial support to strengthen smallholder farmer-driven seed systems by:

- Promoting and supporting participatory approaches such as farmer field schools, community seed banks, participatory plant breeding and varietal selection, and seed and food fairs. For example: mobilize research and crop improvement institutes to help smallholder farmers develop the kinds of seeds they need to adapt to climate change.
- Given women's important role, target women in particular for support, to build on their knowledge and social networks.

3. Put strengthening farmer seed systems firmly on the national climate change adaptation agenda by:

- Including this in the upcoming National Adaptation Plan – one of the mechanisms being put in place to access international climate finance.

4. Scale up investment to adapt agriculture to climate change, as part of efforts to meet the Malabo target to invest 10 percent of the national budget in agriculture – and target support at smallholders, particularly women.

NOTES

- 1 Oxfam (November 2016) The Longest Lean Season. Available at: <https://www.oxfam.org/en/research/longest-lean-season>
- 2 FEWSNET (October 2016) Southern Africa Food Security Outlook. Available at: <http://www.fews.net/southern-africa/zimbabwe/food-security-outlook/october-2016>
- 3 RIASCO (13th October 2016) Key Messages. Available at: <http://reliefweb.int/report/world/riasco-key-messages-humanitarian-impact-el-ni-o-angola-lesotho-madagascar-malawi>
- 4 Seed System Security Assessment Zimbabwe (2009). Available at: http://seedssystem.org/wp-content/uploads/2014/03/zimbabwe_2009_final_report.pdf
- 5 ZIMVAC (Zimbabwe Vulnerability Assessment Committee) Rural Livelihoods Assessment Report 2016, p47. Available at: http://reliefweb.int/sites/reliefweb.int/files/resources/zimvac_2016_rural_livelihoods_assessment.pdf
- 6 The \$2bn figure is cited in Zimbabwe's INDC – NB this figure is taken from the overall needs for the sector identified in the 2013-2018 Zimbabwe Agricultural Investment Plan (ZAIP) <http://faolex.fao.org/docs/pdf/zim152671.pdf>, and figures for 2012 are available here: https://eeas.europa.eu/sites/eeas/files/nip_eu_version_unsigned_en_0.pdf .
- 7 This figure corresponds to the share for the main agricultural ministry – the Ministry of Agriculture, Mechanisation and Irrigation Development. Estimates of the share of budgetary allocations to all relevant agro-ministries (including the Ministry of Lands, and Water etc) are between 5 and 6%. Figures for 2010 and 2011 are available on p35 of the ZAIP, <http://faolex.fao.org/docs/pdf/zim152671.pdf>, and figures for 2012 are available here: https://eeas.europa.eu/sites/eeas/files/nip_eu_version_unsigned_en_0.pdf .
- 8 Marginal regions are Natural Regions III, IV and V – which are characterized by high temperatures (above normal), limited and unevenly distributed rainfall.
- 9 The Sowing Diversity = Harvesting Security programme supports farmers to select and breed their own high quality seeds – then multiply them – through a network of farmer field schools and seed banks. It also supports farmers to grow these crops and turn them into nutritious foods for household consumption as well as for local markets. CTDI established 7 community seed banks in 6 districts and over 250 Farmer Field Schools. Out of the 7 CSBs, 3 were established in collaboration with FACHIG and Dabane Trust. The seed banks are benefiting over 20,000 households in the targeted districts.
- 10 Sowing Diversity: Harvesting Security (2016) Baseline study and Policy Brief. Available at: <http://www.sdhsprogram.org/publications/technical-report-conceptual-and-methodological-development-for-a-baseline-survey/>, and <http://www.sdhsprogram.org/publications/building-on-farmers-perception-and-traditional-knowledge-biodiversity-management-for-climate-change-adaptation-strategies/>
- 11 Op cit ZIMVAC p48, http://reliefweb.int/sites/reliefweb.int/files/resources/zimvac_2016_rural_livelihoods_assessment.pdf
- 12 Op cit ZIMVAC, p47 http://reliefweb.int/sites/reliefweb.int/files/resources/zimvac_2016_rural_livelihoods_assessment.pdf
- 13 Oxfam Novib (2013) Aide Memoire. Available at: http://www.jatropha.pro/PDF%20bestanden/AideMemoire_1371OxfamNovib_Final.pdf ,
- 14 Latest available data. <http://tasai.org/wp-content/uploads/Zimbabwe-brief-final.pdf>
- 15 These three varieties include two OPV varieties (one of which was bred by public research institute ICRISAT), and one hybrid. <http://seeds.seedco.co/sorghum>.
- 16 Agricultural Marketing Authority (October 2016) Agro-Input Monitor. Available at: <http://www.ama.co.zw/wp-content/uploads/2016/10/Agro-input-bulletin-issue-8-of-year-2016-.pdf>
- 17 FAO 2015 Voluntary guide for national seed policy formulation. Available at <http://www.fao.org/publications/card/en/c/272c15fb-0949-479d-aba9-72d918891fc5/>

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