Developing policies on access to plant genetic resources

Many African governments have signed international laws governing the protection of the rights of breeders on the use of genetic resources, of which seed is the carrier. But these laws don't always match national realities in Africa, where most farmers depend on the informal exchange of genetic material. Integrated Seed Sector Development (ISSD) Africa research has presented new options for policies that suit the need of African farmers.

In the past years, a debate has been going on between advocates of the protection of intellectual property rights for plant breeders, and those against it. Proponents hope that a system of plant variety protection will incentivize breeding and the introduction of new varieties, while opponents fear that such a system favours foreign seed companies and criminalizes the large majority of farmers that exchange seed in the informal system. A recent study in five African countries and Haiti shows that smallholder farmers access 90.2% of their seed from informal systems, with the majority of seed being bought from local markets. South Africa, Kenya and Tanzania are already members of the International Union for the Protection of New Varieties of Plants (UPOV), and many other countries have made a commitment to join. Yet UPOV does not allow farmers to trade seed of a protected variety.

As part of ISSD Africa, an expert meeting was held in Cape Town to address the question of how countries can protect the interests of breeders, while also providing leeway to smallholder farmers and the informal seed system. Farmers together with representatives of the seed industry, civil society and UPOV all took part in the meeting. It was the first time that opponents met with proponents.

'I see this meeting as the first step in a larger process towards balancing the interests of breeders and smallholders', explains Bram de Jonge of Wageningen University. It is possible to balance the two, he argued during the ISSD Africa conference held in Nairobi in September 2016. In the past years, De Jonge and colleagues conducted policy research and held expert meetings on the issue. The first important finding is that plant variety protection is only relevant for a very small segment of crops grown. Only 15% of farmland is planted with seed from the formal sector. And in the formal sector, few crops are protected. Applications for protection have mainly been done for flowers and vegetables for export, and to a lesser extent for hybrid maize. Also, the revenues of public research institutes from plant variety protection have so far been very limited. Most food crops are not commercially interesting enough to bother about applying for protection.

'That leaves space for an interpretation of UPOV', remarks De Jonge, 'which makes a distinction between commercial farmers that need to pay royalties for seed, and small-scale farmers that don't need to'. Smallholders or resource-poor farmers can be exempted and allowed to freely save, exchange and sell farm-saved seed, without harming the interests of breeders too much. This would be legally possible, as UPOV allows

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an exemption for acts carried out privately and for non-commercial purposes. In fact, Ethiopia has a draft law on plant variety protection that provides an exemption for smallholders who do not earn more from their crops than the average household income. Zambia does the same for smallholders who cultivate less than two hectares with one crop. Kenyan policy doesn't differentiate between small-scale farmers and commercial farmers.

The question of whether differentiating between categories of farmers is possible, and how to do so practically, was discussed in depth during the conference in Nairobi. In future, guidelines could be developed and assistance offered to governments on how to adapt plant variety protection laws.

Several experts at the Nairobi conference suggested not to invest too much time and energy in plant variety protection laws, but instead invest in the development of more hybrid varieties of more crops. Hybrids offer a biological way of protecting breeders' rights, as farmers need to buy new seed every season in order not to lose the advantages of the hybrid variety. While 'hybridization' would protect the interests of breeders, affirms De Jonge, farmers who are not able to buy new seed every season, would be the victims of such a trend.

Seed laws

Some experts at the conference argued that seed quality and marketing laws on issues other than intellectual property rights are even more hostile to integrated seed sector development. Many countries have seed laws and regulations on how to produce, distribute and sell seed. These seed laws often prohibit the sale and exchange of uncertified seed of unregistered varieties. Through ISSD Africa, many seed laws were studied and compared. One conclusion was that the overwhelming majority of such laws are designed to support formal seed sector activities, and ignore or undermine farmers as seed producers and sellers. For example, under many laws it is difficult to register farmer-derived varieties. Formalities in the registration and certification of seed and producers impose high costs that small-scale farmer seed producers cannot meet. The recommendations made during the conference in Nairobi were to support stronger representation of smallholder farmers in seed law development, and to lobby for explicit consideration for farmer-based seed systems in seed laws.

'Climate change demands better access to genetic resources'

Climate change is real for African farmers. They need new crop varieties that are adapted to the new climate, but the material required to breed these new crops is often not available within the country, according to Gloria Otieno and Michael Halewood of Bioversity International, who conducted ISSD Africa research on the issue. International treaties offer opportunities for international exchange. But local capacity building is needed to get access to this material and use it.

Over the past years, Gloria Otieno, Michael Halewood and colleagues have been working with farmers in Zimbabwe, Zambia, Uganda, and Rwanda. As Otieno explains, 'Climate change is having a big impact on African farmers. The variability increases, planting seasons change, rainfall is erratic, temperature changes. We asked farmers what crops they grow to adapt to this situation. They may have farmers' varieties that are more tolerant for drought, but they may also have other traits the farmers don't like so much, like poor taste or lower yield. We want to help them by looking for material that is more suitable to their changing needs due to climate variability.'

Through participatory exercises with farmers, the researchers found what traits are needed by farmers to respond to climate changes, for example an early-maturing variety with a shorter growth period. Otieno >

Bram de Jonge, Wageningen University.

Michael Halewood, Bioversity International.

further elaborates: 'Then we looked in national gene banks at what genetic material is available that meets these needs, using the latitude and longitude and other data of the place where the material was collected.' In practice, farmers rarely get material from gene banks, but the materials that gene banks have collected from the country give an indication of what is there.

The researchers discovered that the number of varieties of crops in national gene banks that are going to be useful to adapt to future climate change is decreasing. Zambia, for example, has 300 accessions of maize from various parts of the country, of which 48 are potentially adapted to the current climate in Chikankata, a region in Zambia. But only eleven accessions are potentially adapted for the predicted climate of 2050 in Chikankata. The conclusion is that to find crops that fit to climate change, it will be necessary to look elsewhere, explains Halewood: 'In the gene banks and breeding programmes of neighbouring countries for example, but the problem is that none of these have digital records of the accessions in their gene banks, so it's impossible to know what they have, and if they are potentially adapted to the conditions in Chikankata.'

So, the next step was to look for information on potentially suitable materials in collections that are available internationally, like those that are maintained by the CGIAR centres, or national programmes that share materials widely, like the USA, Germany or the Netherlands. Through a database that includes information about all these collections, the researchers were able to locate 87 accessions of maize that are potentially adapted to the climate of 2050 in Chikankata, Zambia. 'Due to climate change, countries are becoming increasingly interdependent on genetic resources', concludes Halewood.

The materials in these international collections were originally collected from farmers, from many different countries and continents. And many countries signed international treaties on access and benefit sharing that allow for exchange of these materials. So, in theory, exchange of these materials for climate change adaptation is possible. The most important treaty in this respect is the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) that creates a system for sharing the genetic resources of 64 crops and forages that are particularly important for food security. Also, the Nagoya Protocol is potentially helpful. As Halewood observes: 'On one hand, the international research community is concerned that the Nagoya Protocol will create impediments to the high volume of exchanges of materials that are necessary for crop improvement research. On the other hand, this international agreement underscores countries' rights to ask for compensation when genetic material is accessed from them.' The Nagoya Protocol also emphasizes the importance of empowering indigenous peoples and local communities to be involved in decision making about whether genetic resources they maintain can be accessed. By ensuring benefit sharing, in theory the Nagoya Protocol will create additional incentives to conserve and use genetic resources.

While many African governments signed the ITPGRFA, it has not yet been widely implemented. That means African governments don't have the systems in place to request and receive materials under the framework of the ITPGRFA. So, mechanisms are not in place for

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Showcasing bean diversity in a community seed fair in Nakaseke, Uganda, in 2012. (Photo by Gloria Otieno)

breeders and farmers to be able to locate, access and provide the genetic resources they need, and related information. The Nagoya Protocol has also not yet been implemented either, which means that there continues to be inadequate recognition of the interests of farmers and breeders as potential providers of materials.

The conclusion of the researchers is that programmes should be set up to create awareness on the good possibilities that both treaties can provide, and to build the capacity to make use of them – not only for breeders and seed companies, but also for farmers and communities. As Otieno explains: 'To develop the skills needed, farmers in the communities need to work together in projects with experts in climate science, in gene bank curation, and in plant breeding. National agricultural research organizations and civil society organizations need to be empowered to convene such projects and activities.'

'An important contribution of our ISSD Africa research', Halewood notes, 'is that we made connections between research on climate impact, on local seed systems and the need for diversity, and international sources of genetic material. We showed that to find solutions for real problems, we need to cut across formal and so-called informal seed systems, and promote coordinated activities involving actors in both systems'. Otieno concludes: 'This research informs the breeding agenda for countries as well. Breeders know they have to respond to climate change, and we found them a way to work on this. It also supports a way for farming communities to be directly involved in finding solutions to the very real challenges they face from climate change.'

ISSD Africa is a community of practice that unites African seed experts, seed programmes and associated organizations, and which aims to increase farmers' access to quality seed through the development of a market-oriented, pluralistic and vibrant seed sector in Africa. ISSD Africa seed experts implemented action-learning projects in 14 African countries, and shared their findings in national seminars that were held over the course of 2016, and in an international synthesis conference that took place in Nairobi in September 2016. This paper reports on the outcomes of the conference and on interviews held during the conference.

The ISSD approach is a farmer-focused and demand-driven seed sector development approach, which caters for the diversity of seed demands. Through this approach interventions are designed that are tailored to specific crops, value chains and seed systems. It is a seed sector-wide and inclusive approach.

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