OPTIONS FOR NATIONAL GOVERNMENTS TO SUPPORT SMALLHOLDER FARMER SEED SYSTEMS

The cases of Kenya, Tanzania and Uganda

Ronnie Vernooy
PREFACE

Hivos and Bioversity International are concerned about the capacity of resource poor farmers to attain food security and respond to climate change. To strengthen that capacity both organizations give high priority to farmers’ access to diverse, good quality and ecologically adapted seeds. Without such access farmers will face a major challenge to provide diverse food to people and sustain the planet.

Freedom to use seeds, especially for breeding purposes including by farmer breeders, is becoming an issue of great concern in North and South. Current open source seed initiatives develop and test systems to maintain this freedom.

OPEN SOURCE SEED SYSTEMS

Many countries are moving to establishing exclusive and monopolistic rights over plant genetic resources for food and agriculture and over the associated knowledge about their use. This obstructs farmers’ access to seeds. Together with Bioversity International, Hivos expresses concern about this trend and searches for functioning alternatives, one being open source seed systems for diversity and resilience. ‘Open source’ is a concept developed by the software movement; its aim is to keep innovations accessible. Likewise, current open source seed initiatives aim to develop an expanding pool of genetic resources that are available now and in the future for unrestricted use by scientists, farmers and gardeners. The distinctive feature of ‘open source seed’ is that its users explicitly commit—based on legal and/or ethical grounds—to maintain the freedom to use the seed and any of its derivatives. This commitment accompanies the seed and its derivatives through any and all transfers and exchanges. ‘Open source’ seed packages are labelled with open source seed pledges or licenses.

Hivos and Bioversity International are jointly implementing a programme funded by Open Society Foundations and the Benefit Sharing Fund of the Plant Treaty (ITPGRFA) to increase farmers’ access to climate smart crops and crop varieties with the help of an open source seed approach. Three types of activities are central in the programme: building viable business cases for open source seed systems; strengthening an emerging global alliance through joint research and learning, and accelerating change in public policy orientation through lobbying and advocacy for open source seed systems.

RECOGNITION, REGULATION AND STIMULATION

This brief, based on a literature review, examines how current seed policies and laws in Kenya, Tanzania and Uganda affect smallholder farmer seed systems. The brief concludes that smallholder farmers are affected by low levels of recognition of and support for their seed management practices. This is contributing to less and more fragile crop diversity in the field and on their plates. The report also suggests that the concrete, field level impact of the most relevant seed related policies and laws for the time being remains modest. What can be done to increase recognition and support of smallholder farmers as seed managers and custodians? Recognizing the potential role of farmers in improving diversity through selection and breeding is crucial. Diversity and resilience can be harnessed by more people selecting and developing new varieties and by ensuring that those new varieties remain accessible for future use.

HIVOS and Bioversity International encourage all readers to join in the current debates on the future of seed management and to explore the possible contribution of open source seeds to more resilient and diverse food systems.

Anne Majani, Willy Douma, Hugo Verkuijl – Hivos
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1. SEED POLICIES AND LAWS IN KENYA, TANZANIA AND UGANDA

This brief examines, based on a small number of references, how current seed policies and laws in Kenya, Tanzania and Uganda affect smallholder farmer seed selection, saving and storage, (re)planting\(^1\), sharing, improvement and marketing (sales) practices. The examination is based on three measures: from more to less recognition of the roles and rights of smallholder farmers related to seed management; from more to less facilitating policy and legal regulations concerning smallholder-based seed management; from more to less (moral, technical, financial) support to smallholder-based seed management. The three measures together can be seen as a reflection of the degree of openness of a seed system. The current degree of openness, calculated as an approximate value, can then be compared to a complete open seed system\(^2\). The brief concludes with some reflections about the bottlenecks and opportunities for moving to more open systems. The paper builds on other research currently underway focused on the relationship between seed policies and laws, and agriculture/ agricultural biodiversity/farmers’ rights/food security (e.g. Currier and Karasapan 2015; Mahop 2015; Visser 2015)

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1. The (re)planting stage is of crucial importance in an open source seed system which is based on the principle of freedom to access any and all progeny/derivatives of a seed. The concept of open source seed system is discussed below. This paper pays attention to all the stages of the seed management process.

2. The three dimensions could be scored in a number of ways. A simple method is to use three values per dimension: high/medium/low. This method will be tested in the paper applied to a number of field studies.
1.1 SEEDS IN A CHANGING SOCIETY

Estimates suggest that 60-80% of the seeds on which smallholder farmers in developing countries depend, is saved on farm or obtained through informal distribution channels, such as exchanges between farmers, community sharing systems, and local markets. The exact volume of seeds that this estimate represents is not known let alone the economic value, but the latter must run into the billions of US dollars per year. What would happen if smallholder farmers would stop being custodians and exchangers of crop diversity? Women farmers play key roles in farmer seed systems, although they are often overlooked by researchers and development personnel, policies, and programs.

This high level of seed autonomy among farmers masks the fact that, almost everywhere, local seed systems are under stress. Agricultural intensification and commoditization, privatization of natural resources (land, trees, minerals, water, seeds), and the strong concentration and expansion of corporate power in the life science industries (including the seed industry) are contributing to a decline in collective local management of plant genetic resources for both conservation and sustainable use (for a critical review of developments in Africa, AFSA and GRAIN 2015). Part of this decline is the breakdown of traditional practices of seed exchange based on kinship and friendship.

Many farming households have become more individualized in terms of decision-making and deployment of knowledge, labor, capital and seeds. Farming practices are becoming more market oriented, and this increased involvement in markets has both benefits and costs depending on local context. Large-scale rural-to-urban migration is contributing to a decline...
in farming in many countries or transforming small-scale family farming into contract farming. It is also leading to the feminization of agriculture, increasing the workload and responsibilities of women in many regions. These trends are affecting local seed production, selection, storage, distribution, and exchange practices, for example, through substitution of local varieties with hybrids that can be easily purchased at local markets.

There are other important changes in the agricultural sector taking place as well, for example, a decline in public support for plant breeding in many countries. This trend is not helping smallholder farmers recognizing that the effectiveness of public plant breeding in terms of responsiveness to smallholder farmers' needs and interests leaves much to desire (for a non-African example, see Song et al. 2010).

### 1.2 TOWARDS NEW REGULATORY SYSTEMS

In Africa, many national governments and a number of regional organizations are working on initiatives to change policies and laws related to seeds towards rules and regulations that are modelled on the International Union for the Protection of New Plant Varieties (UPOV) 1991 Convention. UPOV 1991 offers strong protection of breeders’ rights. The exception to breeders rights are defined in Article 15 allowing farmers to exchange, save seed for propagation on farmers’ own holding and for crops with historic common practice of seed saving. The regional organizations active in this regards include the African Regional Intellectual Property Organisation (ARIPO), the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of West African States (ECOWAS), the Organisation Africaine pour la Propriété Intellectuelle (OAPI), and the Southern African Development Communities (SADC).

ARIPO has spearheaded the development of a draft harmonized Plant Variety protection law, which was approved to be in compliance with UPOV 1991 by the UPOV Council on 11 April 2014. Civil society organizations have voiced their concern about this development stating that these initiatives are not supportive of or antagonistic to farmer smallholder seed systems (AFSA and Grain 2015). Others argue that even for those countries and regional organizations that plan to become a member of UPOV and draft their national Plant Variety Protection law based on the UPOV 1991 Convention, there is the possibility to create legal space for smallholder farmers and their traditional seed management practices. One important way to do this is through the ‘private and non-commercial use exemption’ which has not been defined in the UPOV 1991 Convention (De Jonge and Munyi 2015). However, the authors do not offer an example of how this could be done.

National seed laws can be more or less supportive of smallholder farmers and their seed systems. They can set high standards (and related cost implications) for the registration, quality control, certification and sales of all types or certain types of seeds, effectively restricting access to and availability of certain seeds (Visser 2015). In Kenya, the recently adopted Crops Act, 2013 (No. 16 of 2013), in Section 14, grants farmers the freedom to register for purposes of economies of scale with a co-operative, factory, outgrower institution, processor or other association as determined by Agriculture Fisheries and Food Authority (AFFA) which shall maintain a register of the association. The same legislation imposes dealers who may include smallholder farmers to collect, transport, store, buy or sell certain crops or crop products (so-called ‘scheduled crops’; listed are beans, finger millet and sorghum) through an obligatory licensing system (Section 16.(1)). The same Act stipulates that the government shall ‘establish experimental stations and seed farms for the development of varieties suitable to the agro-climatic conditions of the area and markets
that provide greatest added value to scheduled crops’ (Section 8 (i)). A recent desk study of 42 different national and regional seed regulations from 25 African countries concludes that the main trend in African seed laws is one of very limited space provided to the informal and intermediary seed systems (as maintained by smallholder farmers) and a modest recognition of their importance in supplying seeds to smallholder farmers (Mahop 2015).

But not only do national policies and laws related to seeds play a role. Over the last 25 – 30 years, access to and benefit sharing of genetic resources (including seeds) have become subjects of formal international law. Key pieces of legislation are the Convention on Biological Diversity (https://www.cbd.int/) and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (a Protocol under the CBD) (https://www.cbd.int/abs/), and the International Treaty on Plant Genetic Resources for Food and Agriculture (http://www.planttreaty.org/). As countries sign these agreements, they are establishing national systems to implement them, such as policies and laws on access to and benefit sharing of genetic resources, on agricultural biodiversity, on seeds. It is to note that some countries are taking a long time to do so. In many countries around the world, the actual systems put in place might be more or less effective in terms of control, compliance, monitoring and enforcement of rules and regulations. Opinions differ about whether or not international agreements actually support smallholder seed systems (see the articles in the Farming Matters special issue of April 2016).

Access and benefit sharing as above described do concern seeds in a material sense, but also the knowledge that generations of farmers and cultivators have invested in growing, conserving, and improving crops. For many local farming communities around the world, seeds also have religious, ethical, spiritual, and sociocultural meaning and values. For those farming communities, seeds are living entities and intrinsic elements of the cosmos on which
we all depend. Acquisition of seeds, therefore, requires recognition of and respect for the local agricultural practices that have led to the development and improvement of agricultural biodiversity over a long period.

1.3 TOWARDS NEW SUPPORTIVE SYSTEMS AND PROGRAMS

Climate change has begun to put additional pressure on farmers’ seed and food production systems and on the multiple functions that they fulfill. Although, in many areas, farmers continue to maintain crop diversity, a significant reduction in the number of crops and crop varieties as well as area planted with diverse crops and varieties is occurring (i.e. the occurrence of temporal and spatial biodiversity loss). Findings from the field point to a decline in diversity of local varieties in many countries. Future impacts of climate change are expected to become more pronounced in many parts of the world, forcing farmers to change their practices and causing them to search for information about crops and varieties better adapted to new weather dynamics. It could be argued that giving farmers better access to crop and crop varietal diversity will strengthen their capacity to adapt to climate change (Vernooy et al. 2016). Creating such space for farmers could be made easier by supportive national policies and laws.

Another area where support could play a key role is the production of quality seed. In a recent study of farming seed systems in Tanzania, 80% of surveyed farmers mentioned that training them in seed production from their own saved seed would be the major kind of support to receive from government and research organizations; it would include seed selection, multiplication, storage and protection (Tanzania Organic Agriculture Movement 2015). The authors of this study recommend that the government of Tanzania revives its QDS program (ibid: v), which seems to have withered in recent years although in some areas district extension officers contend that they continue to offer training in QDS production to farmers including topics such as seed handling, marketing and postharvest handling (Tanzania Organic Agriculture Movement 2015). The same study reveals that farmers’ main reasons to purchase seeds (mostly maize and vegetable seeds, and to a small extent groundnut, rice, sesame, sorghum, sunflower) from formal sources, in order of importance as perceived by surveyed farmers, are high yield, drought resistance, pest and disease resistance and early maturity (ibid: 30). This could point to what might be key challenges in their own seed production practices.

Some projects and programs implemented by national and international research and development organizations are already trying to do so by: engaging communities as partners in national conservation efforts, for example, through collaboration with the national gene bank and the exchange of seeds and related knowledge; create biocultural heritage areas that promote the conservation and revival of native crops and crop varieties and related traditional knowledge and practices; support legally protected farmers seed production and commercialization enterprises based on the improvement of local varieties; establish formal agreements between farmers and breeders on the distribution of monetary and non-monetary benefits derived from collaborative activities, such as participatory plant breeding (Song et al. 2016); set up community biodiversity management funds to promote the conservation and sustainable use of local varieties (de Boef et al. 2013); establish and support community seed banks with multiple functions (Vernooy et al. 2015); and develop a strategy toward open source seed systems (Bioversity International 2014; HIVOS and Bioversity International 2015; Open Source Seed Initiative, n.d.).
OSSI, established in May 2012 and based in the USA, is likely the longest operating open source seed initiative. It aims to offer a new way to save and exchange seed that ensures the seed will remain free of patents, licenses, and other restrictions on freedom to use. This method of accessing seeds involves commitment to an open source seed pledge. The pledge reads as: “You have the freedom to use these OSSI-Pledged seeds in any way you choose. In return, you pledge not to restrict others’ use of these seeds or their derivatives by patents or other means, and to include this Pledge with any transfer of these seeds or their derivatives.” (http://osseeds.org/) Second, OSSI maintains a list of crop varieties that have been pledged as “freed seed” and provides a link to sources of seed for those varieties. Third, OSSI raises awareness of the importance of keeping seeds unencumbered from legal restrictions and free to be used, shared, saved, bred, and sold (http://osseeds.org/faqs/). How plant breeding is financed and integrated in open source systems, in the absence of public sector involvement and/or support, remains a serious challenge (Lammerts van Bueren, 5 May 2016, personal communication). Some innovative ideas are being developed to respond to this challenge, such as an open source seed license (Kotschi and Rapf 2016).

1.4 FROM MORE CLOSED TO MORE OPEN SEED SYSTEMS
Many smallholder seed systems encompass the following interrelated components: seed selection, seed saving and storage, seed (re)planting, seed sharing (through exchanges with family, kin, friends, neighbors, fellow members of organizations or associations), seed improvement, and seed marketing (sales). Usually, in this cycle farmers themselves take care of seed quality control in one way or another and to some degree of strictness (unfortunately,
this is an area that has not been very well researched). However, most often they do not use formal rules and regulations, such as prescribed by formal seed regulations at international and national levels. For most smallholder farmers around the world availability (including when there is crop failure which can leave farmers without seed for the next planting cycle), affordability and reliability are important criteria when it comes to seed selection combined with adequate yielding capacity (considering local conditions), no pest and disease incidence and yielding produce that has good taste as defined by consumers – the household in the first place and local consumers when produce is marketed. These activities are mirrored in the formal seed system where seeds flow from gene banks (ex situ storage) to breeders to seed producers to quality control agencies to distribution channels to end-users (farmers). Smallholder farmers all over the world depend on access and availability to diverse seeds in quantities that satisfy their needs and are of good quality – in some countries in recent years, so-called fake seeds have made strong inroads. Farmers have been duped as a result.

International agreements and national policies and laws influence, at least in theory, one or more of these components of smallholder farmer seed systems. From the point of view of the viability of smallholder seed systems, this influence can be categorized and measured in three ways: from more to less recognition of the roles and rights of smallholder farmers in relation to seed management; from more to less restrictive regulations concern the cycle of smallholder-based seed management; from more to less supportive of the smallholder-based seed management cycle. The degree of openness could be defined as the composite result of these three measures.

Based on this analytical construct, how do countries of our interest score on each of the three measures: recognition; regulation; and support? How do current seed policies and laws, in practice, in Kenya, Tanzania and Uganda affect smallholder farmer seed selection, saving and storage, (re)planting, sharing, improvement and marketing (sales) practices? If the degree of openness is limited, what would be needed to move from more closed to open systems? We review, based on a limited number of references, the current situation in three countries: Kenya, Tanzania, Uganda. The three communities are member of the African Union\(^3\) and the East African Community\(^4\).

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\(^3\) The African Union has developed model legislation for the protection of the rights of local communities, farmers and breeders and for the regulation of access to biological resources. http://www.farmersrights.org/pdf/africa/AU/AU-model%20law00.pdf

\(^4\) The East African Community is developing a harmonized seed policy and a protocol on sanitary and phytosanitary measures for seeds.
2. KENYA: A NEW INSTITUTIONAL FRAMEWORK IN PROGRESS

The country’s National Seed Policy is dated 2010. Two important pieces of legislation are the Seeds and Plant Varieties (Amendment) Act (with a 2015 Amendment underway), 2012 and the Seeds and Plant Varieties Act (Ch. 326) of 1 January 1975 (1991). The 2012 amended Act brought Kenyan legislation in line with UPOV 91. Kenya acceded to UPOV 91 in April 2016; this became active in May 2016. According to Braunschweig et al. 2014, the result was that the scope of protection of breeder’s rights was broadened while the rights of farmers to freely use, sell and exchange seeds was further restricted. The amended Act allows farmers to propagate the products of the harvest on their own farm including of protected varieties. The Act has specific provisions on variety registration and seed certification. International and national breeders have made ample use of the Act and obtained over 800 plant breeder’s certificates mostly for ornamental crops and to some extent for maize and wheat (Braunschweig et al. 2014: 23). The Act otherwise does nothing to recognize or support smallholder farmers as seed producers and traders (Mahop 2015). Kenya is a member of COMESA and the binding Seed Trade Harmonized Regulations of COMESA (adopted in 2014) will likely lead to a revision of the 2012 Act to align the national law with the regional framework. It is also to note that Kenya’s Constitution 2010 has two relevant provisions:

- Article 11 (3)( C ) which states that parliament shall enact legislation to recognize and protect the ownership of indigenous seed and plant varieties, their genetic and diverse characteristics and their use by the communities of Kenya.
- Article 69 (1) (a) which states that the state shall ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefit.

According to a number of studies, Kenyan smallholder farmers rely heavily on the informal seed sector to obtain seeds of their major crops with percentages ranging from 75 to 100, with the exceptions of maize and rice. Farmers themselves produce seed, not formally registered as seed producers, of most open-pollinated varieties of cereals, grain legumes and vegetatively reproduced crops. Farmers procure hybrid maize from private and public companies and rice from public companies (e.g. Braunschweig et al. 2014: 25). The same study also reports that there are other important ways in which farmers’ seed systems are connected to the formal system: through a number of participatory crop improvement (PCI) projects and through the acquisition by farmers of improved varieties from government demonstration and experimentation fields (ibid: 29). While PCI could be seen as formalized collaboration, obtaining seeds from fields appears ad-hoc and informal. The cited study does not make clear whether or not there is effective implementation, monitoring and reinforcement of seed related policies and laws.
**CASE STUDY: EAST AND COAST SMALLHOLDER FARMERS’ SEED SYSTEMS IN PRACTICE (BASED ON MCGUIRE AND SPERLING 2016)**

This study presents findings of a comprehensive seed system security assessment in six countries including Kenya (completed in 2011, selected sites: the East and Coast of Kenya). The assessment focused on seed availability, accessibility and quality. The data for Kenya indicate that interviewed farmers in recent years acquired seeds in % of total seed supply as follows: local market 40.1%, own stock 36.2%, agrodealer 11.6%, friend/neighbor/relative 5.7% and government 5.1% (despite several decades of investment in strengthening the formal seed supply sector). In both regions farmers were found to invest relatively large household sums on seed purchases in particular for maize, greengram and cowpea. In terms of acquiring new varieties in recent years, the % were: government 39.6%, agro-dealer 17.8% (note that agro-dealer networks in Kenya are well developed), local market 15.6%, NGO/FAO 14.2%, friend/neighbor/relative 9.3%. The authors conclude that these data suggest that new varieties will not spread fast and far as the actual releases are mostly one-off and free aid interventions coordinated by government, NGOs or FAO.

In terms of the policy environment, the authors conclude that across all the six countries there is a need to redress the imbalance of focus and support from the formal seed sector to the smallholder seed systems toward a more integrated seed system. One of the measures the authors suggest is investment in improved seed storage.

**Assessment East and Coastal Kenya smallholder farmers’ seed systems**

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<td>Farmers rely heavily on seeds from the informal sector with a high share of acquisition at local markets. Farm-saved seed reproduction not mentioned as an issue.</td>
<td>Limited to one-off aid interventions.</td>
<td>Farmers could benefit from improving seed storage capability.</td>
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3. TANZANIA: FROM STATE TO PRIVATE SECTOR SEED DEVELOPMENT

During the last 25 years, Tanzania has moved from state-controlled agricultural and seed sectors to private sector development. The 1989 National Seed Industry Development Programme marked the beginning of this change allowing private seed companies to operate in the country. Currently, the private sector operates mainly in maize seed production and trade, importing maize hybrid seed and some sorghum hybrids (70 per cent of all certified seed) (ASARECA/KIT 2014). Small local seed companies deal in sorghum, rice, legumes and some OPV maize varieties. The private sector is taking on seed quality services. Société Générale de Surveillance (SGS), the world’s leading inspection, verification, testing and certification company, has established an office in Dar es Salaam (ASARECA/KIT 2014).

The Seeds Act No. 18 of 2003 and amendment of 2014 (under revision) focus on commercial farmers, but create space for smallholder farmers to produce and market Quality Declared Seeds. The Act is otherwise silent on farmers’ right to use, exchange and sell farm-saved seed (Mahop 2015). Some concerns exist that the amendment under revision will make it hard for smallholder farmers to benefit from improved seeds while at the same time curtailing their right to reuse farm-saved seeds (Tanzania, Organic Agriculture Movement 2015). In 2012, Tanzania enacted a new Plant Breeders’ Rights Act which is in harmony with UPOV 1991 to which the country acceded in 2015. Currently, both the Tanzanian Seeds Act of 2003 and the Seeds Regulations of 2007 are under review to accommodate related legislation such as the Plant Breeders’ Rights Act of 2012, regional and international agreements, and the legal and institutional framework of the seed industry in Tanzania. The review of the Seed Act 2003 may have both positive and negative impact on smallholder farmers’ seed systems. Among the proposed amendments are stricter control of formal seed sector quality (fake seeds are a very serious problem), and some modification of the regulations of QDS production and marketing. What seem to be lacking is a proposal to exempt smallholder seed producers from the strict seed production regulations, such as has been done in Ethiopia in the Seed Law (Seed Proclamation No. 782/2013) (African Center for Biodiversity 2016).

Tanzania is not a member of COMESA (Kenya and Uganda are members), but is a member of SADC. SADC adopted the Technical Agreements on Harmonisation of Seed Regulations in 2008 (covering seed variety release, seed certification and quality assurance, and quarantine and phytosanitary measures for seeds), but does not oblige its members to harmonize national legislation with regional decisions. It remains to be seen how the government of Tanzania will respond to the harmonized SADC seed regulations. The SADC framework allows for the registration of landraces and other local varieties in the SADC variety database (thus implicitly recognizing that these varieties cannot be evaluated based on DUS and VCU criteria), but not in the regional variety catalogue. The latter only allows varieties tested for DUS (Distinctness, Uniformity and Stability) and VCU (Value for Use and Cultivation) criteria to be produced and marketed according to the regulations.

Tanzania has had a long-term on-farm seed program supported by the government of Denmark. In this program the formal seed sector supplies the initial seed of high quality to smallholder farmers who then multiply the seed on their own farms which is then labelled Quality Declared. The seed producers themselves are responsible for quality control (Monyo et al. 2004).

The Seeds Regulations 2007 set strict standards for seed quality making it very difficult for farmers to market their seeds. For example, for beans the requirement is 98% purity and 80% germination; maize 95% purity and 80% germination; rice 95% purity and 70% germination (Tanzania Organic Agriculture Movement 2015: 46).
The Plant Breeders’ Rights Act of 2012 (No. 222) complies with UPOV 1991 and does not support smallholder breeding efforts. The Tanzania’s Plant Breeders’ Rights (PBR) Act of 2012 replaces the Protection of New Plant Varieties (Plant Breeders’ Rights) Act No.22 of 2002. The aim of the new PBR Act of 2012 (which is based on UPOV 1991) is to promote plant breeding activities and stimulate and promote agricultural development. The PBR Act of 2012 accords strong rights to breeders in terms of saving, reusing and exchanging the propagating material of protected varieties, whether these emanate from the private or public sectors. The PBR Act of 2012 does not restrict the rights of farmers, because the law provides for activities that are conducted privately and for non-commercial purposes, under section 31 (1)(a). Under section 31 (2), Breeders’ rights do not extend to farmers who use harvested material from planting the protected variety for propagating purposes on their own holdings of a particular variety. According to the African Centre for Biodiversity (ACB), the current institutional framework in the country does not do enough to recognize farmers’ rights and support flexible and adaptive seed quality control processes. ACB argues that what are needed are exemptions in the seed law for all uses of farm-saved seeds, remove propriety ownership on all seed once it enters the farmers’ seed system, government programs and budgets should support farmer experimentation and the improvement and development of farmers’ varieties (ACB 2016: 20).

The National Agricultural Policy of 2013 encourages farmers to use improved seeds and provides support to purchase inputs. The policy recognizes however that at present only about 10% of all seeds used are improved seeds. The policy does little to recognize or support smallholder seed systems. Quality Declared Seeds are allowed but can only be marketed at the local level and producers and varieties need to be registered.

Overall, Tanzania has a tight regulatory framework, at least on paper, with a focus on the commercial sector and little recognition or support for smallholder seed systems (ASARECA/KIT 2014).
**CASE STUDY: MANGAE VILLAGE IN MOROGORO DISTRICT AND LAIKALA VILLAGE IN DODOMA DISTRICT (BASED ON WESTENGEN AND BRYSTING 2014)**

This study about genetic resources, seed systems and adaptation to climate change was carried out in two villages where maize and sorghum are major agricultural crops, agriculture is currently facing climate stress, and maize and sorghum cultivation are projected to be under future climate stress. Study findings revealed that the local seed systems are made up of informal and formal elements, and that most farmers source maize and sorghum seed mostly from informal seed sources, their own harvest and local markets being the most important ones. For maize, formal sources supply 24% while for sorghum 8%. In terms of variety types, sorghum varieties are mostly local (i.e. farmer varieties) while for maize improved varieties are more commonly grown than local varieties. Improved maize varieties enter through the formal system. On-farm seed selection and recycling of improved open-pollinated maize variety seeds are common practice. Farmers combine local varieties and improved maize varieties to cope with climate stress (drought in particular) while for sorghum they mostly use local varieties. The study does not mention/discuss the impact of policies and laws.

**Assessment Mangae village in Morogoro district and Laikala village in Dodoma district Tanzania**

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<td>Farmers do not seem to be restricted in their seed activities.</td>
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**CASE STUDY: SEED SYSTEMS STUDY IN EIGHT AGRO-ECO-LOGICAL ZONES (BASED ON TOAM 2015)**

This study carried out in 2015 revealed that the major source of seeds for smallholder farmers is the farmer managed seed system with regard to rice, groundnut, beans, sunflower, but that for maize and vegetables, farmers also rely on the commercial sector. Surveyed farmers mentioned that their reliance on own seeds is driven by affordability and availability. They were less convinced about the quality of own saved seeds. Farmers reported to be satisfied with the use of farmer-saved seeds although they mentioned a number of challenges including seeds affected by pest and
diseases in the field and in storage and the shortage of seeds when crops fail. The study reports that farmer-saved seeds do receive little or no support from the extension service; on the contrary, extension agents encourage farmers to buy (improved) seeds instead. The study argues that such disregard of the role of farmer-saved seeds is backed up by a lack of recognition and support in the Seed Act No. 18 of 2003 and amendment of 2014, the Seeds Regulations of 2007 and the National Agricultural Policy of 2013. Farmers opinioned that they could benefit from training in seed production of their saved seeds and from more support from government and research organizations.

**Assessment Eight agro-ecological zones in Tanzania**

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<td></td>
<td>Farmers appear to be under some pressure to purchase modern varieties.</td>
<td>Farmers are interested to receive training in seed production.</td>
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CASE STUDY: THE NON-ADOPTION OF IMPROVED CROP VARIETIES (BASED ON HAUG ET AL. 2015)

This in-depth study carried out in 10 regions and 15 districts explores why relatively few farmers in Tanzania are using improved crop varieties promoted by the government and international donor agencies. They main reason mentioned by interviewed farmers is affordability in relation to both the low profitability and the high risk of farming. Another reason is lack of access to agro-dealers who sell improved crop varieties. Lack of access also includes access to QDS which so far are only available in a few places and in small quantities – farmers expressed interest in QDS because the price is lower than of hybrid varieties while the quality acceptable. The study points out that availability of farmer preferred varieties is another limiting factor. The private sector is only interested in hybrid maize and neglects all other crops thus seriously limiting farmers’ options. Analyzing some of the underlying issues related to non-adoption the authors argue that apart from high seed prices, poor policy implementation due to lack of human and financial resources is one of the main causes. This includes the insufficient support to integrating the formal and informal seed sectors, for example, through the outscaling of QDS production and the promotion of OPV varieties (for maize in particular).

Assessment Seed system in 10 regions and 15 districts in Tanzania

<table>
<thead>
<tr>
<th>RECOGNITION</th>
<th>REGULATION</th>
<th>SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>low</td>
<td>medium</td>
<td>low</td>
</tr>
<tr>
<td>Farmers are under some pressure to purchase modern varieties, but cannot afford/find them in most of the cases.</td>
<td>QDS production remains marginal.</td>
<td>Patents not mentioned as an issue.</td>
</tr>
</tbody>
</table>
4. UGANDA

“...the limited number of farmers or communities multiplying quality seed is a major constraint to agriculture in Uganda. At the moment, about 30,000 metric tons of seed are required annually for planting, yet only 10,000 metric tons of improved seed is produced. Dealers in poor quality and fake seed have taken advantage of this deficit. Multipliers of quality seed should use this opportunity.” Dr. Karyeija, Commissioner Crop Inspection and Certification, Ministry of Agriculture, Animal Industry and Fisheries, quoted in ISSD Uganda 2015a: 5).

The Seeds and Plant Act 2006 and the draft National Seed Policy 2014. The Act and Policy do not address farmer’s right to use, exchange and sell farmer-saved seeds. The draft Policy aims to create a well-regulated national seed sector that ensures access and availability of seeds of high quality and planting materials produced in diverse seed systems. The policy is accompanied by the National Seed Strategy that defines tasks and activities and allocates budgets (IISD Uganda 2015a). The draft policy does address the informal seed sector in a supportive sense: Objective 3 aims to enhance the production of quality seeds within the informal seed system (Mahop 2015). Uganda is a member of COMESA and in the context of recent policy development, it is expected that the government will align the Seeds Act 2006 to the COMESA regulations.

The draft policy has a section about the recognition and promotion of Quality Declared Seeds (the 2006 Act does not mention QDS). The Integrated Seed Sector Development (ISSD) Uganda programme is supporting 30 so-called Local Seed Businesses producing Quality Declared Seeds in 25 districts which will have a legal basis in a provision in the draft National Seed Policy 2014 that adds QDS as the sixth class of seed to be included in the Seed and Plant Act of 2006. About 900 farmers are members of the Local Seed Businesses in the Northern, South Western and West Nile regions. In the first growing season of 2015, more than 1,000 tons of seed were produced and sold with the certification done by the national seed laboratory in Kawanda. Seeds met the minimum national standards of variety purity and germination (IISD Uganda 2015b).

In 2014 the Plant Variety Protection Act 2014 was adopted aimed to increase agricultural productivity, profitability and sustainability of cropping systems. The Act regulates breeders’ rights. The Act recognizes and protects the rights of breeders over the varieties developed by them and promotes the supply of good quality seed and planting materials. There is no recognition of farmers’ rights; only of plant breeders’ rights. It is further to note that the Industrial Property Act 2014, Section 13, excludes plant varieties from patentable inventions.

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CASE STUDY: COMMUNITY SEED BANKING FOR IMPROVING THE RESILIENCE OF FARMERS THROUGH ENHANCED USE OF CROP VARIETAL DIVERSITY: LESSONS, CHALLENGES AND OPPORTUNITIES IN UGANDA (CONTRIBUTED BY ROSE NANKYA, BIOVERSITY INTERNATIONAL UGANDA BASED ON A PRESENTATION)

The common bean (Phaseolus vulgaris) is an important crop in Uganda and there is a richness of varieties. Studies on seed systems in Rubaya and Kabwohe indicate that there is a high degree of seed exchange between/
among farmers from multiple informal sources (average 86% in 2013), in particular from farmer-saved seeds, neighbours and local markets. However, access to quality seeds is constrained by the high costs and poor quality of seeds and loss of vigour when re-planting seeds season after season.

To overcome some of these constraints Bioversity and the National Agricultural Research Organization (NARO) introduced community seed banks to Uganda, such as in Kiziba started in 2010. Seed banks can provide many benefits including: securing common bean diversity by bringing back to the community rare and traditional varieties; empowering farmers through capacity building in seed quality management and production practices and creating networks between farmers, national genebanks and breeders; and promoting farmers’ rights through sharing of seeds, technologies, traditional knowledge, monetary benefits and participation in decision making.

Documenting seed supplies and exchanges through the Kiziba seed bank demonstrates its importance as a source of seed diversity especially following poor harvests. Findings of a study on Angular leafspot disease (ALS) of the common bean demonstrates that growing together a mixture of bean varieties provides increased protection from disease damage and higher yields. The Kiziba seed bank is seen as a success story, gaining recognition in other communities and some initial interest from local governments. Despite this, technical, financial and legal challenges are faced. Through the work of Bioversity and partners recognition of community seed banks has been incorporated in new draft seed and PGRFA policies, but currently there is little financial support from governments and no mechanism for the registration of landraces or farmer-improved varieties. This correspondingly favors marketing of improved registered varieties demotivating farmers to conserve, use and add value (e.g. through seed production and marketing) to seed diversity from local communities.

**Assessment**: Seed system including community seed bank in Rubaya and Kabwohe, Uganda

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<tr>
<th>RECOGNITION</th>
<th>REGULATION</th>
<th>SUPPORT</th>
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<tbody>
<tr>
<td>low (but growing)</td>
<td>medium</td>
<td>low (but growing)</td>
</tr>
<tr>
<td>Some recognition in new PGRFA related policies.</td>
<td>Farmers are not able/allowed to register farmer varieties.</td>
<td>Kiziba seed bank receives some support from National Agricultural Research Organisation.</td>
</tr>
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<td></td>
<td>Patents not mentioned as an issue.</td>
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CASE STUDY: WEST NILE REGION (BASED ON ISSD UGANDA DATA PUBLISHED IN 2015)

A 2015 study of seed system security in Uganda’s West Nile region, an area affected by the influx of refugees, indicates that farmers rely heavily on seeds obtained from own sources and local markets while less so on agro-input dealers, social networks, community-based systems and seed aid organizations. Farmers surveyed mentioned that price, timely availability and enough quantity are important factors that determine their choice of supply. Farmers expressed concerns about seed quality with regard to seeds obtained at local markets and high prices with regard to seeds sold by agro-input dealers. Poor storage facilities and infection with pests/diseases were also mentioned as a problem. Farmers stated that overall they are satisfied with varietal suitability including the introduction of new varieties of crops such as cassava, maize, beans and rice, but that in some occasions they lack proper varietal information while in others they would have liked to be involved in selecting new germplasm. In the context of environmental stresses, farmers seem to make good use of mixes of local and improved varieties. However, farmers face some challenges due to climatic variability.

Assessment: Seed system in Uganda’s West Nile region

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<tr>
<th>RECOGNITION</th>
<th>REGULATION</th>
<th>SUPPORT</th>
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<tbody>
<tr>
<td>low</td>
<td>low</td>
<td>low to medium</td>
</tr>
</tbody>
</table>

Farmers do not seem to be restricted in their seed activities.

Patents not mentioned as an issue.

Farmers like to be more involved in crop improvement activities.
5. CONCLUDING REMARKS

A cautious assessment of the short field experiences included in this paper suggests that, although in all three countries governments are strengthening seed regulatory environments mostly toward the more restrictive side of the scale, smallholder farmers are far more affected by low levels of recognition of and support for their seed management practices than by restrictive policies and laws. This could be due to a combination of factors: the relevant policies and laws do not directly affect farmers’ current practices; insofar they affect these practices on paper, there is no effective implementation let alone enforcement. Suggestions for some supportive policy and legal measures have been put forward in recent time (e.g. in Uganda) and QDS has gained formal ground in Tanzania and Uganda, but a strong supportive policy and legal environment is missing.

From a farmers’ perspective, the field studies clearly demonstrate that the top priority is timely availability, affordability and improved access to good quality seed of portfolios of crops and crop varieties, including seed of ‘novel’ crops and crop varieties that are better adapted to climate changes that are occurring. The field studies seem to suggest that such portfolios could include farmer-, farmer improved and modern varieties. The studies also point to farmers’ interest to take part in crop/seed improvement activities related to all the stages of the seed management process from selection to marketing. Such involvement seems to be lacking in all three countries. None of the studies mention the patenting of seeds and implications this might have for smallholder farmers. At this moment in time, smallholder farmers appear not to be hampered by patenting, but this could change over time.

Along the chain of seed management, some of the studies suggest that conservation capabilities could be improved. The same is true for crop improvement –farmers in many areas are expressing interest to be more involved in (participatory) variety selection and some in participatory plant breeding.

Tentatively, the conclusion is that in order to create more open seed systems, efforts should not only be targeted to stop the development of stricter regulatory measures, but to the design and lobbying for the adoption of measures that lead to more recognition of and support for smallholder farmer seed systems. Such measures could also stipulate that civil society organizations with interest and expertise in the subject of seeds, including farmer associations, cooperatives and community seed banks, could play a key role in implementation of policies and laws.
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