



Building resilience through “Open Source Seed Systems” for Climate Change Adaptation in Kenya, Uganda, and Tanzania: What are the options for policy?

An Open Source Seed Systems (OSSS) Policy Brief, June 2018.

Executive Summary:

Inadequate availability of quality and preferred plant genetic materials in East Africa continues to constrain smallholder agriculture and threatens food security especially during times of unfavourable weather. Only about 20 percent of seed used by East African farmers is supplied by the formal (or commercial) sector; the rest is sourced from farmer-managed seed systems (FMSS), which are not supported by the existing policy or legal environment. Associated mechanisms for seed certification and quality assurance are unclear; the rules and regulations regarding the sale and exchange of seed are sometimes stringent. These restrict farmers’ ability to save and freely exchange seed for food security. These factors, coupled with homogenisation of agriculture and climate change, are leading to a reduction in agricultural biodiversity and food and nutrition insecurity. The Open Source Seed Systems (OSSS) approach enhances access to and availability of seed and genetic resources by ensuring freedom of use and exchange among farmers and breeders without restrictions on subsequent varieties and their derivatives.

This Policy Brief is a result of a series of national and regional stakeholder consultations and a policy write shop on the establishment and maintenance of Open Source Seed Systems that ensure inclusivity of farmers and enhance freedom to develop, access, and use plant genetic materials. The brief is also based on results from research on seed networks and policy and legislative frameworks in Kenya, Uganda, and Tanzania. The stakeholders recommend the following policy options for successful establishment and implementation of OSSS.

1. Recognition of farmer-managed seed varieties in regional and national policy and legislative frameworks;
2. Development of policies and legislation that facilitate establishment of functional open source seed systems;
3. Establishment of farmer-inclusive regimes for intellectual property rights;
4. Creation of an institutional coordination, collaboration, networking, and awareness mechanism for a harmonised and functional national genetic resources coordination system;
5. Promoting research and development for establishment and growth of OSSS that includes documentation, characterisation, and evaluation of genetic biodiversity managed by farmers as well as development of climate-smart varieties; and
6. Mobilising and allocating resources for development of OSSS.

Introduction

Climate change poses a serious and ever-growing threat to the food and nutrition security of resource-poor farmers globally. In Kenya, Tanzania, and Uganda, this trend is likely to lower agricultural production rates by an average of 22 percent by 2050, sending farmers deeper into poverty and malnutrition (IFRPI, 2018). The homogenization of agriculture to single crop or variety production in the hope of attaining higher yields and the associated loss of biodiversity have decreased the resilience of resource-poor farmers. In addition,

accessing seed appropriately adapted to both biotic and abiotic stresses is becoming a challenge. Only about 20 percent of seed used in the three East African countries is supplied by the 'formal' (or industrial) production seed system. Over 80 percent of the seed used by smallholder farmers in East Africa is sourced from the 'informal' seed systems, also referred to as farmer-managed seed systems (Louwaars & De Boeuf, 2012). Farmers have been managing seed and propagating plant materials through on-farm conservation, maintenance, and selection for diversity. They engage in seed saving, re-use, exchange and sales amongst family, neighbours and communities to produce the bulk of the food consumed. Thus, farmers are the custodians of genetic biodiversity and related indigenous technical knowledge (ITK).

Recent global "corporatization" of seed systems, made possible by exclusive intellectual property rights, has led to diminishing diversity and access to genetic resources (Chaudhuri, 2003; Otieno et al., 2017). Seed and genetic resources policies and legislation restrict access to and freedom of exchange of seeds among farmers. For example, Kenya's 2013 Crops Act (Part IV – Licensing and Taxation Provision) presents limitations to smallholder farmers in their freedom to process or sell seeds unless they are licensed as dealers. Seed diversity does not occupy a significant place within the business models of the largest seed companies. By using intellectual property rights (patents, Plant Variety Protection), big players in the seed industry are eradicating seed-saving and sharing practices, diminishing the gene pool and reducing the adaptive capacity of smallholders. The right to adequate food implies that national food and nutrition security strategies and policies should accommodate the rights of people to access diverse seed and consequently diverse and nutritious diets.

This Policy Brief is a result of a series of national and regional consultations in East Africa and discussions among stakeholders interested in the establishment and application of Open Source Seed Systems. The brief is also based on research on seed networks as well as policy and legislative frameworks in the three countries. It is an appeal to policy makers and custodians to provide for a "facilitative" environment for the establishment and development of OSSS.

Contradicting policy and legislation

The prevailing policy and legislative environment in East Africa does not adequately support farmers' roles in establishing and maintaining genetic diversity. The region operates under several national, regional, and international policy and legal instruments that control production and distribution of genetic material as shown in Text Box 1.

Text Box 1: Policy and legal framework control seed production and distribution in East Africa	
International Treaties and Conventions the countries are signatory to	1991 Act of the International Convention for the Protection of New Varieties of Plants UPOV 1991 (Kenya, Uganda)
	The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) (Kenya, Uganda and Tanzania)
	Convention on Biological Diversity (CBD) (Kenya, Uganda and Tanzania)
	The Nagoya Protocol (Uganda and Tanzania)
Regional Seed Agreements and Protocols the countries have signed	COMESA Seed Trade Harmonized Regulations (2014) (Kenya and Uganda)
	Protocol on Establishment of East African Community (EAC) (Kenya, Tanzania and Uganda)
	EAC Standards for Variety Testing and registration, Seed certification and Phytosanitary Control (Kenya, Uganda and Tanzania)
	The African Regional Intellectual Property Organization (ARIPO) Arusha Protocol of Protection of New Varieties of Plants (Tanzania)
	SADC Technical Agreement on Harmonization of Seed Regulations (2008) (Tanzania)
	SADC Protocol on Protection of New Variety off Plants (Plant Breeders Rights)
National Seed Policies and Legislation	
Kenya	<ul style="list-style-type: none"> • Constitution of Kenya (2010) • National Seed Policy (2010) • Crops Act (2013) • Seed and Plant Variety Act 2012 (Amendment for 2013 and 2016) • The Kenya Plant Health Inspectorate Service IKEPHIS, (2012) Act • In draft: Seeds and Plant Varieties (Conservation, Access and Benefits Sharing of Plant Genetic Resources) Regulations 2015
Tanzania	<ul style="list-style-type: none"> • National Seed Policy (2013) • Seed Act No. 18 of 2003 • Seed Act (Miscellaneous Amendment) of 2014 • Plant Variety Protection Act (2014) • Plant Protection Act (1997) • Plant Breeders Rights Act of 2012 • Draft National PGRFA Policy (2017) • In draft, revision of Seed Act 2003 and its regulations of 2007
Uganda	<ul style="list-style-type: none"> • National Agriculture Policy of 2013 • Seed and Plant Varieties Act of 2006 • Seed Act Amendments of 2014 • Plant Breeders Rights Act of 2012 • Plant Varieties Protection 2014 • Draft National Agriculture Policy 2017

The policies, legal and regulatory frameworks at national levels support formal/industrial seed production. They are silent on how farmers can produce and share their crop varieties. Furthermore, there are gaps, overlaps, and contradictions in the policies and legislation; for example, plant variety protection (PVP) and seed trade laws prohibit saving, re-use, and sale of farm-saved seed of 'protected' varieties. However, Article 9 of the ITPGRFA that all the three countries are signatories to and therefore obliged to implement in their national laws and policies gives provisions for the freedom of farmers to sell, save, use, and exchange saved seeds/propagating material. The Arusha Protocol for the Protection of New Varieties of Plants within the framework of the African Regional Intellectual Property organization (ARIPO), which Tanzania signed, promotes strong plant breeders' rights, which also undermines farmers' rights to save, share, and exchange seeds. Articles 10, 12, and 13 of the plant treaty has provisions on facilitated access through the multilateral system of access, benefit sharing, (MLS)¹ and equitable sharing of benefits arising from the use (including commercial) of plant genetic resources included in the MLS. Although the three countries have signed and are party to the ITPGRFA, national legislations are yet to be developed and implemented at country levels. Thus, the treaty has not been used to create supportive legal and regulatory instruments for its implementation. As a result, farmers' contribution to the diversity of crops is not recognised and access to their plant genetic materials is not guaranteed. Consequently, they do not get maximum benefits from existing benefit sharing agreements.

Based on the analysis of national seed policies and legislation, we found that the current variety testing, registration, and release mechanisms in the three countries are left exclusively to breeders, without space for the release and use of farmers' varieties. This is despite the fact that farmer-preferred varieties evolve over time, have desired cultural and functional traits, and may be well adapted to changing climatic and environmental conditions.

1 The multilateral system of access and benefit sharing established by contracting parties of the ITPGRFA is a system that facilitates access to plant genetic resources for food and agriculture, and sharing, in a fair and equitable way, the benefits arising from utilisation of these resources, on a complementary and mutually reinforcing manner. There is a list of 64 crops to be shared freely through the multilateral system. <http://www.fao.org/3/a-i0510e.pdf>

Moreover, PVP laws and plant breeders' rights in the three countries are based on UPOV provisions that create restrictions on the use and exchange of seeds by farmers. Under UPOV, farmers are only allowed to save and re-use seed of a protected variety "on their own holding" and "within reasonable limits and subject to safeguarding the legitimate interests of the breeder", which may imply that farmers have to pay a royalty to remunerate the breeder. The exchange and sale of farm-saved seed, as is common practice amongst farmers in informal seed systems, is now prohibited for protected varieties (De Jonge, 2014). Under these regimes, varieties are protected for 20 years but in Kenya, all released varieties regardless of the time they were released are still protected and cannot be saved, re-used, or sold. This limits access to diversity for farmers in the East African region.

In Tanzania and Uganda, seed policy reviews have seen the introduction of a new class of seed known as quality declared seed (QDS), which farmers and seed cooperatives can produce, label and sell. This is based on FAO's recently developed Quality Declared Seeds (QDS) concept, which provides opportunities for small-scale seed production and local sale, and therefore improves access to seeds for farmers at local levels. Under this scheme, local seed business, local cooperatives, and farmer groups can now produce QDS under guidelines developed by FAO². This is an accepted set of guidelines on standards and procedures for seed production that has been taken up in Tanzania and Uganda but not in Kenya, owing to stringent seed regulations in the country, i.e, the 2005 Seeds and Plants Act that prohibits production and sale of seed by farmers.

Exclusion of smallholders' in national research, documentation, and policy support

Research programmes have paid much attention to high-value commercial seed development within the formal seed system. As a result, only minimal research has been carried out on farmers'

2 In 1993, FAO Seed and Plant Genetic Resources Service, in consultation with relevant experts, produced and published specific crop guidelines as Plant Production and Protection Paper No. 117 on quality declared seed technical guidelines on standards and procedures.



PVP laws favour only breeders as having the rights to protect plant varieties even though farmers may sometimes hold and share traditional knowledge related to these varieties

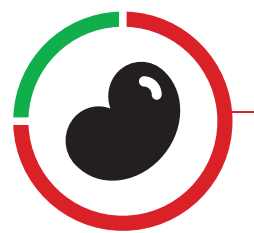
Photo: Akil Mazumder-Pexels

varieties with their participation and contribution. Furthermore, PVP laws favour only breeders as having the rights to protect plant varieties even though farmers may sometimes hold and share traditional knowledge related to these varieties. National and institutional research policies do not prioritize development and maintenance of local/communities' genetic resources; moreover, documentation of what is in farmers "hands" and related traditional knowledge that may contribute to knowledge for the development of new varieties is lacking. Furthermore, resource investment into farmers' seed varieties and community seed banks is inadequate.

The "Open Source Seed systems" a solution?

Despite the legal protection, the formal seed production sector has not adequately served smallholder farmers' demand for seeds particularly in affordability, diversity, availability, and reliability. Intellectual property rights on seeds has increased their costs due to exclusive breeders' ownership rights. As a result of the prevailing international,

regional and national policies and legal frameworks, there is an increasing reduction in agricultural biodiversity, food and nutrition security, and resilience to climate change. Throughout the 20th Century, 75 percent of plant genetic resources has been lost as farmers worldwide left their multiple local varieties and landraces for genetically uniform and high-yielding varieties (FAO, 2010). There is need to develop a system that allows for protected freedom of exchange of seeds and genetic resources for resilience and food security.



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Photo: Miguel A. Padriñán-Pexels

The Open source seed systems (OSSS) is a concept that allows for freedom of access and use of plant genetic material, prohibits exclusive rights, applying this to any subsequent derivatives of those materials. A distinct feature is a commitment—legal or ethical—to maintain the freedom to use seed and any of its derivatives. Anyone committing to OSSS agreement receives freedom of access and use of the material under Material Transfer Agreements (MTAs). Open source seeds would be available for farmers and breeders with freedom to use, sell, re-use, and allow selection and breeding of derivatives. A clear acknowledgement of the source of breeding material is required and the derivatives can only be distributed under an “open source” arrangement. Most importantly, the OSSS concept allows for commercial seed production by farmers and farmers cooperatives.

In an attempt to increase the supply of improved seed and reduce the certification costs, the FAO developed the QDS model, which has been taken up in Tanzania and Uganda. The model improves accessibility to varieties for climate change adaptation and in essence aids in increasing access to diverse seeds. There are no provisions for the use of QDS in Kenya.

Awareness and understanding of the concept and role of OSSS and how these can address gaps and challenges posed by the formal seed system is limited. As was reported in one of the country forums, “Open source seed systems will be a way of ensuring that there is access to seed as a common good by protecting it against privatisation so that it is a regulated and “protected global commons.” OSSS constitutes, in principle, a framework that can be adapted to protect seeds production and distribution. This commitment accompanies the seed and its derivatives through any and all transfers and exchanges” (Uganda, Kenya and Tanzania OSSS Reports, 2016, 2017). This is a concept and

its application will require a policy and legislative environment that accommodates extensive awareness creation, acceptance, adoption, and effective adaptation.

Policy recommendations (Building an enabling environment for OSSS)

This brief is a presentation of policy recommendations for effective establishment and functioning of OSSS for East Africa as a region and in the specific respective countries.

Recognition of farmer-managed seed varieties

There is a need for recognition, in regional and national policy and legislation frameworks, of the value and contribution of farmer varieties to food security and nutrition, livelihoods, biodiversity, and resilience to climate change. Policies and legislations should embrace a human rights-based approach and provide exceptions and exemptions in national laws to protect farmers’ rights to save, share, exchange, and sell seeds. The East Africa region and each specific country should fast track domestication of the provisions of Article 9 of the ITPGRFA to give farmers official recognition of their contribution. Some key practical ways can be through registration of farmers’ varieties to allow for their production under the QDS frameworks provided through the FAO.

Establishment of a functional open seed source system

Communities are responsible for development, maintenance, and conservation of biological

diversity. Governments should develop policy and legislation that facilitate and support the role of OSSS, e.g. by supporting farmers' groups to take up related enterprises. There should be an obligation for breeders to work with farmers at all stages of the seed development processes. There is need to amend current regulations to allow for free access to seeds registered by public institutions, community seed banks, and universities. Farmers can access and trade their seed and researchers can use them for related studies in adaptation to climate change.

Varieties whose protection period has expired should be declared 'open source'. There is need for development of a separate registration procedure with simplified criteria other than DUS (Distinctness, Uniformity, and Stability) and VCU (Value for Cultivation and Use). The processes should include farmer-chosen traits for official registration of their varieties. Registered farmers' varieties should be made available for multiplication under QDS regulation.

The enactment of policies that protect farmers' rights to save, exchange and use seeds

There is a need to develop specific provisions for farmer-managed seed systems, protecting them in the public domain (in community, national and regional gene banks) from exclusive ownership and patenting. When breeders and seed companies access seed varieties, they should have prior consent from local communities, who should benefit from utilisation of these resources as outlined in the Convention on Biological Diversity (CBD). There is a need to fast track domestication of the provisions of the ITPGRFA, CBD and Nagoya protocol to ensure that farmers are involved in managing gene banks

and linking them to in-situ and ex-situ conservation measures.

Institutional coordination, collaboration, networking, and awareness

This is the establishment of a harmonised and functional national genetic resources coordination mechanism that allows for stakeholder representation and participation by government and other non-state actors. Creating awareness about the open seed source system will require learning, knowledge and dissemination, networking, using national portals, opinion leaders, and social media forums.

Research and development for establishment and growth of OSSS

Genetic biodiversity in the hands of farmers and national gene banks should be documented, characterised, and evaluated using the best research tools including DNA fingerprinting. This is to prevent loss of farmer-managed seeds through bio-piracy and genetic erosion. While documenting, farmer-friendly variety testing criteria and registration procedures should be created to help capture indigenous technical knowledge (ITK) related to their genetic resources.

Participatory research methodologies must be employed during the entire process from collection to evaluation of beneficial germplasm. The farming communities, as custodians of genetic resources, must have their contribution recognised in the conservation and development of plant genetic resources and accrue benefits from them.

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