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Building Farmer-Managed Seed Systems and Preserving Indigenous Seeds in East Africa



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Cover picture: Seed Fair celebrations in Hoima, Uganda, 2018. Mr David Ombalo from the Policy department [Ministry of Agriculture] and the Kenyan government’s chief lead person on Seed legislation attending.

Acronyms

ABN	African Biodiversity Network
ABS	Access and Benefit Sharing
AGRA	AGRA -Just AGRA [formerly Alliance for a Green Revolution in Africa]
AU	Africa Union
ARIPO	African Regional Intellectual Property Organization
ASBP	African Seed and Biotechnology Partnership Platform
CBD	Convention on Biological Diversity
COMESA	Common Market for Eastern and Southern Africa
DUS [nDUS]	Distinctness, Uniformity, and Stability [Dus]- formerly included n-Newness or novelty
EAC	East Africa Community
EALA	East African Legislative Assembly
FAO	Food and Agricultural Organization -UN
FMSS	Farmer Managed Seed System [s]
FMSF	Farmer-Managed Seed Frameworks
GeRRI	Genetic Resources Research Institute, [KALRO]
ISP	Input Subsidy programs- National Agricultural Inputs Subsidy Program [NAISP] since 2008 in Kenya, the Agricultural Sector Development Program [ASDP] since 2009 In Tanzania
IPTGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IK, ITK, TK	indigenous knowledge [IK], Traditional knowledge [TK], folk knowledge,
IP, IPR	Intellectual property
KALRO	Kenya Agriculture Livestock and Research Organization
KEPHIS	Kenya Plant Health Inspectorate Service
MLS-ABS	The Multilateral System of Access and Benefit-sharing
QDS	Quality Declared Standards
SNS&Ts	Sacred Natural Sites and Territories
TASAI	The African Seed Access Index
UPOV	“Union internationale pour la Protection des Obtentions Végétales [fr.] The International Union for the Protection of New Varieties of Plants.
WTO	World Trade Organization
WTO-TRIPS	WTO Agreement on Trade-Related Aspects of Intellectual Property Rights [TRIPS]
WIPO	World Intellectual Property Organization

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Abstract

This document explores the complex relationship between seeds, biodiversity, and cultural heritage in East Africa. The focus is on farmer-managed seed systems (FMSS) and indigenous knowledge, and the challenges and opportunities surrounding seed sovereignty and food security in the region. Seeds hold significant cultural and spiritual value across various traditions, symbolizing hope, fertility, and interconnectedness with nature.

Resolution 372 by the African Commission emphasizes the protection of Sacred Natural Sites and Territories, including seed conservation and traditional knowledge. Farmer-managed seed systems (FMSS) play a crucial role in maintaining seed diversity, ensuring food security, and adapting to climate change. Indigenous seeds offer resilience, pest and disease resistance, and nutritional value, but face challenges like gene hunting and legal frameworks hindering diversity.

International agreements like UPOV and TRIPS Agreement can impact farmers' rights and biodiversity conservation, raising concerns about uniformity, privatization, and erosion of traditional knowledge. National Seed Sector Frameworks need to encompass biological, socio-cultural, and legal considerations of seeds, with Kenya, Uganda, and Tanzania showing varying progress. Stakeholders in the seed sector include farmers, seed companies, governments, NGOs, researchers, and international organizations, with diverse interests and varying influences.

Challenges like food imports, reliance on external inputs, and inadequate support for FMSS hinder food sovereignty and sustainability. Input subsidy programs raise concerns about cost, market distortions, and lack of support for agroecological farming. Policy revisions, legal reforms, increased funding, capacity building, and collaboration are crucial to strengthen FMSS and ensure agricultural resilience.

Preamble

The African Biodiversity Network (ABN) is dedicated to addressing the complex challenges confronting Africa's biodiversity and socio-economic landscape. Established in 1996 and officially registered as a Trust in Kenya in 2002, the ABN has grown into a collaborative network of 41 partners from 18 African nations. The ABN's core mission prioritizes indigenous wisdom, ecological agriculture, and the protection of biocultural diversity-related rights.

One of the ABN's critical focus areas is the preservation of farmer-managed seed systems (FMSS) in East Africa, particularly in Kenya, Uganda, and Tanzania. Studies conducted in these countries demonstrate the manifold benefits of FMSS, ranging from enhancing seed diversity to strengthening food sovereignty and community resilience. To safeguard and promote FMSS, the ABN advocates for the implementation of robust legal frameworks, capacity-building initiatives, seed exchange programs, and awareness campaigns. These interventions aim to enhance the quality, availability, and accessibility of indigenous seeds, thereby contributing to the conservation of seed diversity across the continent.

Moreover, the ABN emphasizes the importance of culturally-centered solutions in addressing Africa's socio-biocultural diversity and ecological dilemmas. By fostering collaboration and knowledge-sharing among stakeholders, the ABN seeks to shape policy landscapes that respect the rights of both people and nature. Based on evidence-based insights from studies in Kenya, Uganda, and Tanzania, the ABN recognizes the critical role of promoting and protecting FMSS in improving seed and food sovereignty, as well as enhancing community resilience to environmental and economic shocks.

In collaboration with partners in Kenya, Uganda, and Tanzania, the ABN, funded by Bread for the World (BftW), conducted an advocacy initiative to advance Farmer-Managed Seed and indigenous seed Systems in the East African region. This study serves as a valuable resource, offering insights into the current status of FMSS, indigenous seeds, and related policies and practices in the region. Through such initiatives, the ABN remains committed to nurturing a network of individuals, communities, and organisations dedicated to safeguarding Africa's rich biological, cultural, and spiritual heritage.

CHAPTER ONE

Study Background

Farmer Managed Seed Systems (FMSS) are a set of knowledge, practices and rules collectively developed by farmers. They are based on communal customs and traditions and are applied to the selection, conservation, use, quality assurance, and circulation of seeds utilized by local communities^{1, 2, 3}. FMSS are the principal source of seeds of food crops in Africa. They are reliable, available, and affordable. Small farmers prefer farm-saved seeds, which are stored locally, require no cash outlay, and can be relied on to produce nutritious crops and seeds⁴.

The contrast to this is the Commercial or Industrial seed system commonly referred in a discriminatory term as the “Formal Seed System”. The Commercial Seed System is made up as a set of rules and standards governing seed activities, including the selection, production, and marketing of seed, and the actors who carry them out under the control and policing of a central authority established to ensure the application of the above rules and standards¹.

This study set out to understand the dynamics, challenges, and opportunities within these Seed Systems and therefore is essential for fostering agricultural resilience and promoting local food security, amidst climate change. Farmers and Indigenous seeds are crucial components of agricultural biodiversity in East Africa, playing a significant role in enhancing food sovereignty, preserving cultural heritage, and promoting sustainable farming practices.

The purpose of this study is to collect and provide additional valuable insights into the current state of FMSS, and indigenous seeds, together with related policies and practices, as well as offer an initial look into the policy gaps in Kenya, Uganda, and Tanzania. The study employed an extensive and systematic literature review

¹ AFSA (2022) Proposed legal framework for the recognition and promotion of farmer-managed seed Systems (FMSS) and the Protection of biodiversity-AFSA publication available <https://afsafrika.org/wp-content/uploads/2022/06/fmss-legal-framework-2022.pdf>

² EOAI (2022) The Farmer Managed Seed Systems (FMSS): [Roadmap of the FMSS](#) Cluster.

³ Shalini Bhutani (2019), Policy Brief: making farmer-managed seed systems work https://www.rosalux.de/fileadmin/rls_uploads/pdfs/Standpunkte/Managed_Seed_Systems_Rev_3_191121.pdf published in August 2019

⁴ Grain (2018): The real seeds producers: Small-scale farmers save, use, share and enhance the seed diversity of the crops that feed Africa. <https://grain.org/e/6035>

methodology mixed with consulting key farming community and seed policy representatives among many civil society leaders. The study used data from Kenya, Uganda, and Tanzania to make a comparative analysis and draw meaningful insights on the practices, challenges, and successes of the commercial and farmer-managed seed systems across the East African region. Another comparative analysis helped identify the legal environment of the Seed sector Frameworks at International, regional, and national levels. To understand the stakeholders involved in the East African Seed sector, the study used various methods. Documented reports, articles, and even social media were analyzed to identify potential stakeholders.

The study identified various calls to action that can be pursued and overall, this document will remain a living template that ABN stakeholders will continue to review, update, and improve even as the policy environment on genetic resources, seed systems and traditional knowledge frameworks continue to evolve.

The Enduring Significance of Seeds in traditions, ancient texts, and religion

Seeds, whether of plant or animal origin, represent the minute threads that compose the sustenance and communal life. Seeds have the potential for life and represent the assurance of nourishment and rejuvenation. When sown in fertile soil, they yield an abundance of grains, fruits, and vegetables, which can feed individuals and foster families through collective experiences in farming and food preparation.

Animal seeds, entrusted to the stewardship of farmers as livestock, provide fats, proteins, clothing, and transportation. Animal Seeds serve as an indispensable component in the ecological continuum. In their unassuming state, all seeds sum up not merely the pledge of sustenance but also the heritage of knowledge, tradition, and collective resilience. Transmitted across generations, these seeds ensure the sustained strength of the community.

Across the globe, indigenous communities hold diverse beliefs and practices surrounding seeds. For many, seeds are gifts from the earth and spirits, entrusted to humans for their care and stewardship. Planting and harvesting rituals often involve prayers and offerings, expressing gratitude and seeking blessings for future abundance. Seeds carry powerful symbolic weight. They represent the potential for new beginnings, the enduring cycle of life and death, and the unwavering hope for a future harvest. In a world facing numerous challenges, the enduring significance of seeds reminds us of our interconnectedness with the natural world and the vital role we play in nurturing and

sustaining life. Seeds have a deep cultural and spiritual significance. These tiny capsules hold not just the promise of food, but also stories, traditions, and a timeless connection to the cycles of life and the very essence of our being.

In ancient Mesopotamia, the gods instructed the hero Utnapishtim to preserve seeds aboard his ark to ensure the continuation of life after the deluge⁵. This story highlights the Mesopotamian belief in seeds as vessels of life and hope, entrusted with the very survival of humanity.

In ancient Egyptian mythology, the god Osiris, who symbolized fertility and agriculture, was often depicted holding a wheat stalk, representing his role in ensuring bountiful harvests⁶. The Egyptians also mummified seeds alongside the deceased, believing they would be essential for their regeneration in the afterlife.

In Hinduism, the goddess Lakshmi, the consort of Vishnu and the embodiment of prosperity and good fortune, is often associated with the lotus flower, which sprouts from seeds that lie dormant in mud⁷. The lotus, with its pristine beauty emerging from murky depths, symbolizes the potential for spiritual growth and enlightenment even amidst challenges.

The Abrahamic religions, including Judaism, Christianity, and Islam, all hold seeds as sacred symbols. In the Book of Genesis, God entrusts Adam and Eve with dominion over all living things, including the seeds of plants. The Books record that God made all trees and shrubs, even the ones bearing seeds, and freely gave them for food. Seed was freely given, and it was assumed to be the gift that would forever be shared freely. However, there was a tragic reversal of this edict, when after 7 years of plenty followed by 7 years of devastating drought under Joseph and Pharaoh⁸, the people sold themselves and their land, and all they had to be given seeds to produce food⁹. "The Judeo-Christian

⁵ Abusch, T., & West, E. B. [2020]. Sowing the Seeds of Uncertainty: The Transmutation of the Mesopotamian Flood Myth in India, Iran, and the Classical World. *Journal of Indo-European studies*, 48[3/4], 325-351.

⁶ Mininberg, D. T. [2001]. The museum's mummies: an inside view. *Neurosurgery*, 49[1], 192-199.

⁷ Kinsley, D. [1998]. *Hindu goddesses: Visions of the divine feminine in the Hindu religious tradition*. Motilal Banarsidass Publication

⁸ Genesis 41:25-36: Pharaoh's dreams of the fat and lean cows and Joseph's interpretation of those dreams as seven years of abundance followed by seven years of famine.

⁹ Genesis 47:13-26: Joseph, having foreseen the famine, wisely stores up grain during the plentiful years, ensuring Egypt's survival through the drought.

and Islamic scriptures state that the Agricultural Seed, which was originally given freely for food, from that time till now, became an item of commerce and taxation, with rates going as high as 20%.

Seeds, Biodiversity, and the African Commission's: A Powerful Connection

The African Commission on Human and Peoples' Rights [ACHPR] in 2015 passed Resolution 372 and marked a significant step towards protecting Sacred Natural Sites and Territories [SNS&Ts] across Africa¹⁰. The SNS&Ts are deeply woven into the lives and cultures of local communities. They often harbour exceptional biodiversity and play a crucial role in seed conservation. Seed-guarding communities within SNS&Ts hold keys to biodiversity. Their diverse plants and animals, adapted to local challenges, store their genetic legacy in seeds - a vast repository. Recognizing this, Resolution 372 calls for protecting both these seeds and the traditional knowledge that sustains them^{11, 12}.

Indigenous communities within SNS&Ts hold generations-old, sophisticated seed management practices, passed down orally, guaranteeing the selection, storage, and propagation of diverse, locally adapted seeds. Resolution 372 upholds their right to maintain and develop these traditional systems, vital for sustaining biodiversity and food security within the communities¹³.

Seeds from Sacred Natural Sites and Territories hold more than genetic potential - they embody the cultural and spiritual heritage of local communities. Recognizing this, as Resolution 372 does, protects both the heritage and the biodiversity it stewards, ensuring these sacred sites flourish for generations to come.

Seeds from Sacred Natural Sites [SNS&Ts] hold diverse genetic material crucial for breeding climate-resilient crops, key to adapting to a changing climate. Resolution 372

¹⁰ Victory! African Commission passes resolution to protect sacred natural sites & territories: https://heinonline.org/holcgibin/get_pdf.cgi?handle=hein.journals/ahry2021§ion=19

¹¹ Wilton, F. Respect Sacred Natural Sites to Guarantee Human Rights, Says New African Commission Resolution. IUCN, 11 October 2017. Available online: <https://www.iucn.org/news/commission-environmental-economic-and-social-policy/201710/respect-sacred-natural-sites-guarantee-human-rights-says-new-african-commission-resolution> [accessed on 15-Feb-24].

¹² Verschuren, B.; Wild, R.; McNeely, J.; Oviedo, G. Sacred Natural Sites, Conserving Nature and Culture; Earthscan: London, UK; Washington, DC, USA, 2010; p. 22. ISBN 978-1-84971-166-1

¹³ GRABE [Groupe Recherche Action pour le Bien-être Ecologique et le développement Durable]: <https://grabebenin.org/>

champions their conservation and utilization, tackling biodiversity loss and climate change in one impactful step¹⁴.

The African Biodiversity Network (ABN) supports its partners¹⁵ in learning from successful initiatives like Uganda's collaboration with the African Institute for Culture and Ecology (AFRICE) to implement Resolution 372, focusing on seed conservation within SNS&Ts.

By recognizing the interconnectedness of seeds, biodiversity, and cultural heritage within SNS&Ts, Resolution 372 offers a promising framework for ABN members to push for the safeguarding of Africa's natural and cultural treasures for future generations¹⁶.

¹⁴ Arjjumend, H., & Beaulieu-Boon, H. H. (2018). Customary Institutions and Rules underlying Conservation Functions of Sacred Sites or Indigenous and Community Conserved Areas. *Grassroots Journal of Natural Resources*, 1(2).

¹⁵ African Biodiversity Network: <https://africanbiodiversity.org/>

¹⁶ Bhati, H. V., & Epstein, Y. (2023). Protection of Biocultural Heritage in the Anthropocene: Towards Reconciling Natural, Cultural, Tangible and Intangible Heritage. *Journal of Environmental Law*, 35(3), 353-375.

CHAPTER TWO

Seed management systems: then and now

Throughout history, the management of seeds has evolved through various systems. In ancient times, indigenous communities relied on traditional seed-saving practices, where farmers selectively saved and exchanged seeds, fostering biodiversity. When Pharaoh bought the Egyptians and Israelites in exchange for planting Seeds, he gave them what was previously food grain in storage. Food that is set aside can and has always been excellent for seed in the next seasons. This fact is hated by the commercial seed industry stakeholders.

With the advent of commercial agriculture, formalized seed management emerged, involving seed storage, selection, and cultivation. The development of seed banks and exchanges further facilitated the preservation and sharing of genetic diversity. In the modern era, industrial agriculture has introduced commercial seed production and distribution, dominated by a few large corporations. To enhance their hold on this lucrative Seed business, dealers introduced binding legislation mandating that Seed for sale must be distinctly packaged, chemically treated and above all else pass germination and purity tests acceptable to the industry kingpins. Advancements in biotechnology have led to genetically modified seeds whose intellectual property rights must be paid for, sparking debates over their environmental and ethical implications.

The contemporary landscape accordingly encompasses a complex interplay of traditional, industrial, and emerging approaches to seed management. Concurrently, there is a growing movement advocating for seed sovereignty, emphasizing local control and traditional knowledge in seed management. The ABN and AFSA Seed Policy work is a part of that movement guiding advocacy and policy initiatives in Africa.

Seed categories: types and differences

The three categories of seeds that are used in agriculture in Kenya, Uganda and Tanzania are Commercial seeds, farmer-managed seeds [FMSS], and indigenous seeds. Intrinsic differences between these categories mandate that these be managed differently by different actors who own them.

- I. Commercial seeds are seeds that are produced and sold by private companies. These seeds are often hybrids and may also be genetically modified [GM] and designed to resist certain pests and diseases. They are also often more

expensive than Farmer Managed Seed (FMS) or indigenous seeds. Commercial seeds are typically owned and controlled by the company that produces them, and they are subject to several regulations, including intellectual property (IP) laws and phytosanitary certification. Commercial Seeds are invariably and interchangeably also called Industrial seeds and are often labelled as Certified Seeds by the regulatory authorities.

- II. Farmer-managed Seeds are seeds that are kept and grown by farmers. These seeds are often locally adapted and have been selected by farmers over generations to be well-suited to local conditions. FMS are typically owned and controlled by the farmers who manage them, and they are not subject to the same level of IP protection as commercial seeds. They are often open-pollinated and the farmers depend on selecting the best field-performing produce, from one season to the other. FMS often requires farmers to retain and use their skills and knowledge to advance the best “seed populations” to other fields (own, family or neighbours) or replant in the next seasons. These seeds are produced locally under Farmer Managed Seed Systems. (FMSS) When the East African governments promote and support only commercial seeds, it is this body of knowledge and practices that erode. Many of the old landraces of maize, beans, rice, potatoes, and ground nuts are successive generation’s early introductions that local farmers have kept improving every successive season.
- III. Indigenous seeds are seeds that have been traditionally cultivated by indigenous communities and peoples. These seeds are often *sacred to indigenous cultures* and have a rich history and cultural significance. Indigenous seeds are typically owned and controlled by the indigenous communities that cultivate them, and they are often protected by traditional knowledge and practices.

Many of the sorghum and millet landraces grown by East African farmers are indigenous and have been grown by the communities for thousands of years. These are drought-resistant cereals native to Africa and used as a staple food for many people. They are a good source of protein and fibre and are gluten-free. Some communities have specific landraces that are used to make traditional beer, bread, and porridge, often traditional condiments that are used in rituals and blessing ceremonies and other cases help stimulate mothers' breast milk.

The use of indigenous seeds requires generational skills and knowledge, that may go beyond food security and any associated rituals and ceremonies. The bitter melon and the thorn melon are closely related vegetables and fruits that communities in East Africa have always preserved, grown, cooked, or eaten ripe for their reported health benefits. Recent research findings confirm that these indigenous crops have essential phytochemicals including proteins, polysaccharides, flavonoids, triterpenes, saponins, ascorbic acid and steroids. Various biological activities have been reported, such as anti-hyperglycemic, anti-bacterial, anti-viral, anti-tumour, immunomodulation, anti-oxidant, anti-diabetic, anthelmintic, anti-mutagenic, anti-ulcer, anti-lipolytic, anti-fertility, hepatoprotective, and anti-inflammatory activities.

Both Farmer-managed and Indigenous seeds are also an important source of income for many East African farmers. Farmers know that it is important to conserve these seeds, as they are a valuable genetic resource. Many organizations are working to conserve farmers' seeds, and there is a growing recognition of their importance in providing food security and nutrition.

Tanzania and Uganda have Quality Declared Seed as an alternative to the commercial certified seed systems. Kenya for a long time rejected this category, but lately has been mooting the idea of Standard Seeds. What are these categories?

Quality Declared Seed [QDS] refers to a semi-commercial seed system where farmers themselves declare and sell seeds they produce, adhering to specific quality standards and verification procedures. Designed for regions with limited resources or where formal certification is challenging as in Uganda and Tanzania, QDS offers several advantages:

Key attributes:

- Accessibility: Easier and more affordable compared to commercial certified seeds, making quality seeds more readily available to farmers.
- Allows the inclusion of locally produced varieties no longer found in commercial Seed systems.
- Empowers farmers by putting some control and ownership of seed production back in their hands, fostering self-reliance and innovation.

Implementation:

- Standards: Clear quality standards are defined for each crop, covering aspects like purity, germination, and disease-free status.

- **Verification:** Mechanisms are established to verify adherence to these standards, often involving farmer-led inspections or third-party verification.
- **Declaration:** Farmers declare the quality of their seeds based on self-assessment and verification, often with labelling to inform buyers.

Benefits:

- **Improved yields:** Access to quality seeds leads to higher yields and income for farmers.
- **Enhanced diversity:** Promotes the use of locally adapted varieties, increasing agricultural resilience.
- **Empowerment:** Strengthens farmer autonomy and knowledge-sharing within communities.

Standard seeds under the Seeds and Plant Varieties Act [Cap 326, Section 2] of Kenya are defined as “commercial” seeds that are marketed after standards have been relaxed on account of emergency or disaster so that such seed is subjected only to laboratory tests and post control observation. This means it is a seed that meets a lower quality standard due to exceptional circumstances. It is somewhat like QDS but the origin is from Commercial certified sources. The law is silent on how far these Standard seeds can be used, as compared to QDS which allows seeds used in limited community regions, wards, or villages.

Can QDS be part of FMSS?

The successful implementation of a Quality Declared Seed [QDS] system within a Farmer Managed Seed System [FMSS] demands a nuanced approach that acknowledges the importance of actual community experiences and capacity building.

Firstly, QDS standards should not be applied uniformly. Tailoring them to specific local conditions, cultivated crops, and the existing expertise of participating farmers is crucial. This customization ensures the standards are practical, achievable, and aligned with the unique needs of each FMSS context.

Secondly, successful QDS integration within FMSS necessitates robust capacity-building initiatives. Farmers require training in various aspects, including the selection of high-quality seeds, effective seed production techniques, meticulous quality control procedures, and comprehensive record-keeping practices. Such training empowers farmers to actively participate in the QDS system and contribute to its long-term sustainability.

- By incorporating these key considerations, QDS can become a valuable tool within FMSS, enhancing the quality and availability of seeds while empowering farmers and strengthening the overall seed system. **Verification mechanisms:** Establishing reliable and transparent methods to verify seed quality is crucial.
- **Market access:** Linking QDS producers with buyers and creating market channels is essential for sustainability.

Table 1: A comparison of FMSS and QDS in East African Countries

Feature	FMSS	QDS
Focus:	Conserving and multiplying seeds within farming communities based on local knowledge and preferences.	Providing a semi-commercial system for farmers to declare and sell quality seeds they produce themselves.
Strengths	Adaptability, resilience, diversity, and community ownership.	More accessible and affordable than formal certification, promotes local seed production, and caters to specific needs.
Challenges	Ensuring consistent seed quality, limited access to improved varieties, and difficulty scaling up.	Requires establishing clear quality standards, verification mechanisms, and trust within the community.
Increased access to quality seed	Farmers have all seed diversity available but quality needs intervention	QDS provides a framework for FMSS farmers to improve and assure seed quality, increasing their access to better yields and income.
Empowering farmers	Under FMSS total Control/autonomy is guaranteed	QDS puts control and ownership of seed production back in farmers' hands, fostering self-reliance and innovation
Enhanced diversity:	Diversity under the control of farmers is full. However, diversity from certified seed sources is subject to breaching UPOV seed laws	QDS allows for the inclusion of locally adapted varieties not found in commercial certified Seed systems, promoting biodiversity and resilience.

Examples:

- **Uganda:** The Omutima Gwa Ruhiira Farmers' Cooperative Society successfully uses QDS to produce and sell high-quality bean seeds

- **Tanzania:** The Seed Alliance supports QDS for various crops, improving market access for smallholder farmers¹⁷.

QDS is a valuable tool for making seeds available at the village level. By addressing implementation challenges and tailoring the system to local farming in East Africa, QDS can contribute significantly to sustainable and equitable agriculture. On the other hand, Standard Seed is highly protective of commercial seed systems and is only available in emergencies.

¹⁷ Kansiime, M. K., Bundi, M., Nicodemus, J., Ochieng, J., Marandu, D., Njau, S. S., ... & Romney, D. [2021]. Assessing sustainability factors of farmer seed production: a case of the Good Seed Initiative project in Tanzania. *Agriculture & Food Security*, 10[1], 15.

Table 2: Summarizes the key differences between commercial seeds, FMSS, and indigenous seeds:

Feature	Commercial Seeds	Farmer Managed Seeds	Indigenous seeds
1. Definition	Seeds that are produced and sold by private companies.	Seed systems that are controlled and managed by farmers.	Seeds that have been cultivated and selected by local communities over generations.
2. Ownership	Private companies	Farmers	Indigenous communities
3. Control	Private companies	Farmers	Indigenous communities
4. IP protection	High	Low	None
5. Regulation	Extensive	Limited	None
6. Adaptability	High	High	High
7. Cost	High	Low	Invaluable
8. Cultural significance	Low	High	High
9. Required knowledge for use	Low	Medium	High
10. Required other inputs	Extreme	medium	Low
11. Adaptation	Poor local adaptation often requires large inputs of water, synthetic fertilizers, and pesticides to support and protect growth and production.	Good local adapted to the climate, soils, and pests.	Often adapted to specific local conditions.
12. Diversity	None is tolerated because of DUS ¹⁸ requirements	Can include a wide range of crops and varieties.	May have a limited number of varieties.
13. Resilience	Narrow to only what is bred in.	Wide. Can withstand stress and adapt to changing conditions.	Maybe more resilient to local environmental stressors.
14. Cultural significance	Very Low	May or may not have cultural significance.	Often have cultural and historical significance.

¹⁸ Distinctness, Uniformity and Stability

The three Seed categories demand a different set of regulatory frameworks. To address ownership through Intellectual property rights, and of use of the seeds, many policies and regulations have been laid out.

This study addresses these policies and regulations and the way these have been implemented in Kenya, Uganda, and Tanzania.

Seed systems refer to a range of *private, community or private* technologies, organizational set-ups, and market and non-market institutions through which seeds are accessed and used in Agriculture¹⁹. Seed systems are how seeds are produced, saved, exchanged, and sold.

Seed systems were first developed by farmers who nurtured plant diversity by breeding and saving seeds to sustain their households and communities. Research and development institutions emerged over time and contributed to seed systems. Together, the farmers' and Commercial "formal" seed systems determine the seeds that are available to farmers, although the Commercial "Industrial" system may be largely absent in some contexts.

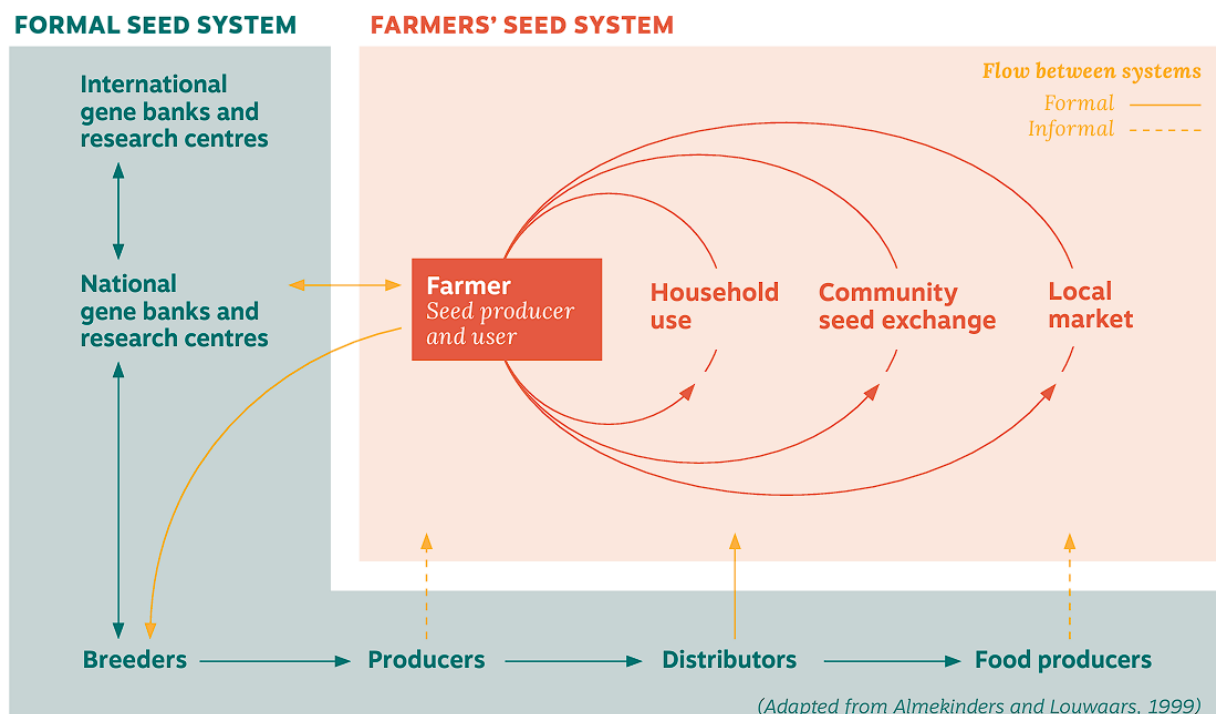
These two systems are interdependent and farmers must be able to make full use of both farmers' and formal seed systems to strengthen their seed security. The diagram²⁰ below shows how these systems can coexist under ideal circumstances. Unfortunately, this is rarely the case. For some lucrative crops like maize, the commercial seed systems dominate and actively create laws, regulations and rules that undermine other sustainable seed source alternatives such as FMSS. This is the gist of the Seed court cases in Kenya currently²¹.

¹⁹ McGuire, S., & Sperling, L. [2013]. Making seed systems more resilient to stress. *Global Environmental Change*, 23(3), 644-653.

²⁰ Almekinders, C. J., & Louwaars, N. P. [1999]. Farmers' seed production: new approaches and practices. Intermediate Technology publications, London.

²¹ Ngana Brygette. 2022. In seed we trust: Farmers fight for the right to own, share seed <https://ntvkenya.co.ke/news-features/in-seed-we-trust-farmers-fight-for-right-to-own-share-seed/> appeared October 16, 2022, and accessed on 11.14.2023

Linkage between farmers' and formal seed systems in the Global South



Smallholder and Indigenous farmers maintain high seed diversity for crop species and varieties. Communities are continuously selecting and conserving seeds to suit their production conditions and meet their food preferences and cultural needs. Varietal diversity is especially high in the centres of origin of crops worldwide. This diversity is essential to feeding humanity. Smallholder farmers produce about 70 per cent of the world's food with these crops²².

Seed laws and regulations determine the seed sector's institutional framework and rule enforcement. This therefore impacts who produces, markets, and sells seeds of which varieties and under what conditions. Various types of legal and policy initiatives directly affect the kind of seeds that small-scale farmers can use, including intellectual property laws that grant state-sanctioned monopolies to plant breeders at the expense of farmers' rights, and seed marketing laws that regulate trade in seeds, often making it illegal to exchange or market farmers' seeds.

²² ETC group. [2017]. Who will feed us? The industrial food chain vs the peasant food web.

Farmers' rights and food sovereignty in East Africa

Farmer-managed Seed systems lead to seed and food sovereignty. Commercial seed systems lead to the availability of seeds that support the narrow goal of increased unit productivity if the seed is certified, large volumes of water and adequate fertilizers are used, and measures are taken to spray against pests and diseases, during the growth of the crop. Farmers accustomed to using certified commercial seeds do not have Seed security problems because the Agro-seed companies are willing and able to make the seeds available, at their stipulated price.

Who should be concerned with seed security? Communities that have been forced into poverty, landlessness, and lack of basic infrastructure, such as food and seed storage facilities, face significant barriers to obtaining any seeds let alone quality seeds.

Governments can create special outreach programs, dubbed seed security, to meet these communities' needs at planting and ensure a certain level of food production and availability. If these deplorable conditions can fester, dependence on external aid sets in. There is an over-reliance on donor Seed and Food assistance programs. Climate change, natural disasters, and ecological degradation are amplified in these communities, impacting their ability to cultivate and secure seeds. Seed Security becomes applicable. To this end, Seed interventions are the major agricultural response during the emergency and recovery phases of humanitarian relief. They are implemented by diverse agencies and widely promoted: for instance, the FAO alone managed 400 such projects in 2 years²³. Seed aid is inappropriate in many circumstances and leads to a loss of sovereignty over genetic resources and food for the community. TASAI has been leading efforts to ensure Seed Aid inclusion in Africa Union and CADDP Seed legal frameworks, despite civil society objections.

Seed Security is applicable where there are gender disparities, a lack of representation in decision-making, and where cultural marginalization has restricted access to resources and knowledge related to Seed ownership and management.

Seed and seed sovereignty have overlapping goals of providing seeds to farmers, but seed sovereignty goes beyond seed security to promote resilient and sustainable food systems. The relationship between seed sovereignty and food security is complex, with

²³ Sperling, L., & McGuire, S. J. [2010]. Persistent myths about emergency seed aid. *Food Policy*, 35[3], 195-201.

seed sovereignty serving as a fundamental basis for a robust, equitable, and fair food system. Seed sovereignty takes on a particular level of importance, becoming more than just access to seeds, but a critical factor in their resilience, self-sufficiency, and sustainable food security.

Farmer's rights are critical for Farmer-managed seed systems

Seed security and Seed sovereignty need to be discussed through the lens of Farmers' rights. What are these rights and how do they affect Farmer-managed seed systems?

Farmer's rights are a set of principles and legal instruments that recognize and reward the crucial role farmers play in conserving, developing, and sharing plant genetic resources (PGR) - essentially the seeds and genetic material of crops and animals. These rights aim to strike a balance between protecting the intellectual property rights of commercial breeders and scientists while safeguarding the traditional practices and knowledge of farmers who have been stewarding PGR for millennia. Farmers' rights fall into 5 distinct categories;

Customary rights: Farmers have the right to save, use, exchange, and sell farm-saved seed and propagating material, just as they have done for generations. This ensures they can maintain seed diversity, adapt to climate change and local conditions, and avoid dependence on expensive commercial seeds.

Access and Benefit-sharing: Farmers deserve recognition and fair compensation for their contributions to PGR. This includes their role in developing (identifying, selecting, conserving, and breeding) new populations of varieties, as well as their knowledge of traditional practices for managing and utilizing PGR.

Participation in decision-making: Farmers have the right to be involved in decisions that affect PGR, such as policies regarding research, conservation, and market access. This ensures their voices are heard and their needs are considered by local and national governments.

Access to resources and knowledge: Farmers should have access to the resources and knowledge they need to effectively manage and utilize PGR. This includes training on sustainable farming practices, access to tools and technologies, and information about germplasm banks and conservation efforts.

The legal framework on farmers' rights is the basic starting point: Each country claiming to respect farmers' rights needs to pass laws that recognize farmers' ownership, role, and importance in managing their seeds and by extension food system at the household level.

The main legal framework for farmer's rights is the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA]. This treaty, ratified by over 140 countries, commits nations to implementing policies and programs that uphold farmer's rights. Since the ITPGRFA concerns itself with food crops only, a lot of the other biodiversity in the hands of farmers [animals, medicinal shrubs, microbiota etc.] must be protected in the other laws, including the Convention of Biological Diversity articles 15 and 16.

Farmer's rights are critical for Food Sovereignty

Farmer's rights empower communities, promote resilient food systems, and lay the foundation for true food sovereignty. By protecting their rights to save, exchange, and breed seeds, farmers gain control over their food systems, reducing dependence on corporations and external inputs. When farmers guard their local varieties, it leads to more resilient and diverse food better suited to local conditions. Their diverse traditional knowledge empowers them to promote sustainable practices and fosters innovation within communities. Giving farmers a voice in shaping policies concerning food and agriculture ensures their needs and priorities are addressed. Finally, when they are compensated for their contributions to PGR, they become incentivized to continue being stewards and sharing genetic resources, vital for long-term food security.

The last two decades have seen an increased focus on the concepts of food sovereignty and agroecological-based production systems in the developing world. This is due to the important role that peasant farmers play in ensuring food security, particularly in the face of climate change, economic crises, and energy shortages.

FMSS provides farmers with access to high-quality seeds at affordable prices, precisely when they need to plant them. This gives farmers a strategic advantage in harnessing unpredictable rains and ensures that their families have food when needed. By being self-sufficient and not relying on market forces that affect food availability and prices, FMSS becomes a crucial pillar in achieving food sovereignty from the family level to the villages in East Africa. However, it is unfortunate that there have been no efforts to document and quantify the contribution of FMSS to the economy of the country and food security. The mapping of local food self-sufficiency in the three East African

countries has never been prioritized, and there is no data available to demonstrate the local farm's contribution to the country's economy when they feed themselves.

Table 3: Similarities and differences between Seed Security and Seed Sovereignty in East Africa.

Feature	Seed Security	Seed Sovereignty
Concept	Focused on access to certified seeds of commercial varieties often as subsidies to vulnerable communities. When seed security is not threatened, Seed supply is left to the whims of supply and demand and Seed merchants' rule.	Emphasizes control and self-reliance of farmers in managing their seeds, including saving, exchanging, and adapting local varieties.
Focus	Ensures provisions of commercial seeds through local governments and Agro-dealerships through emergency seed distribution. Market regulations are critical through KEPHIS,	Promotes farmer-centered systems where farmers manage their own seeds, cultivate diversity, and adapt to local conditions.
Actors	A top-down approach led by governments, NGOs, and seed companies.	A bottom-up approach driven by farmers themselves, with support from local communities and organizations.
Benefits	Provision of commercial Seeds to vulnerable communities helps ensure some food security, particularly in crises and for resource-limited farmers.	Increased resilience to climate change, enhanced genetic diversity, and economic self-reliance for farmers.
Challenges	Dependence on external supply chains, potential corporate control, and lack of focus on local adaptation.	Requires capacity building, infrastructure, and policy changes to support farmer-managed seed systems.
Relationship	Seed security indicates that the communities are vulnerable. Caring Agroecology communities can use this as a stepping stone to seed sovereignty by providing initial access to diverse seeds and building trust in farmer-managed systems.	Seed sovereignty contributes to seed security by increasing local seed availability and adaptation, enhancing resilience to shocks that can often be the source of seed scarcity.

Gender Issues in Farmer-Managed Seed Systems [FMSS]:

FMSS, while offering valuable benefits, can perpetuate or exacerbate existing gender inequalities²⁴. The active roles and contributions of women, as custodians and

²⁴ Hosken, L. [2017]. The critical role that African rural women play as custodians of seed diversity and wild relatives in the context of climate change. *Biodiversity*, 18[2-3], 98-101.

caretakers of seeds in many countries are underappreciated or ignored entirely. The resulting gender inequalities manifest as;

1. Unequal Access and Control:

Men often control access to resources and decision-making about seed selection, purchase, and exchange, limiting women's participation. Women may have limited access to training, information, and extension services, leading to knowledge gaps and inadequate seed management skills. Furthermore, unequal land ownership has restricted women's ability to participate in seed production and benefit from its income.

2. Gendered Roles and Responsibilities:

Women often bear the burden of seed harvest, storage, processing, and preservation, adding to their workload without equal recognition or compensation. In many cases, as seen in East Africa, crop choices may prioritize male-dominated cash crops, neglecting women's priorities for food and nutritional needs of the family. Women may not receive equal access to benefits generated from seed production or sales, further marginalizing them economically.

3. Cultural Norms and Practices:

Traditional customs and gender norms may limit women's participation in seed-related activities or decision-making processes. In addition, due to limited mobility, women experience restricted access to markets, training, and seed exchange networks.

These issues need addressing to ensure that FMSS are truly inclusive and empower both men and women to contribute to and benefit from sustainable seed systems.

CHAPTER THREE

The Status of Indigenous Seeds and FMSS in East Africa

The status of indigenous seeds in East Africa is complex, marked by both progress and challenges. There is a growing recognition of indigenous seeds for their resilience to climate change, pest and disease resistance, and nutritional value. Farmers and researchers are increasingly appreciating their contribution to food security and biodiversity. Unfortunately, this means that gene hunters are raiding important germplasm for useful traits²⁵ that can be swapped into new crop and animal backgrounds to confer resistance to disease, pest, or climate adaptation²⁶. Initiatives to promote the use of indigenous seeds by various organizations are underway²⁷. This includes research on their properties, training programs for farmers, and market development efforts.

Despite the lack of supporting FMSS legislative frameworks, local farming communities are establishing more and more seed banks to conserve and share indigenous varieties. In Kenya, the CSO Network [ABN, BiBa and PELUM] has promoted the conservation and utilization of indigenous seeds through community seed banks and farmer training programs, helping preserve germplasm diversity and ensuring continued access for future generations.

Indigenous seeds and FMSS in East Africa continue to face several challenges. There is a clear erosion of traditional knowledge. Practices associated with growing and storing indigenous seeds and managing Local Seeds continue to be lost, especially with younger generations shifting away from traditional agriculture.

Kenya and Tanzania become signatories to the draconian UPOV '91 legal framework. This together with supporting legislation, will unintentionally hinder the FMSS and seed exchange systems that have traditionally sustained indigenous seed diversity.

²⁵ Juma, C. [2014]. The gene hunters: Biotechnology and the scramble for seeds [Vol. 996]. Princeton University Press.

²⁶ Rock, J. S., Schnurr, M. A., Kingiri, A., Glover, D., Stone, G. D., Ely, A., & Fischer, K. [2023]. Beyond the Genome: Genetically modified crops in Africa and the implications for Genome Editing. *Development and Change*, 54(1), 117-142.

²⁷ Kansiiime, M. K., Ochieng, J., Kessy, R., Karanja, D., Romney, D., & Afari-Sefa, V. [2018]. Changing knowledge and perceptions of African indigenous vegetables: the role of community-based nutritional outreach. *Development in Practice*, 28(4), 480-493.

The promotion of commercially produced hybrid seeds, often marketed as high-yielding, will continue to challenge the adoption of less productive but more resilient indigenous varieties, especially for maize and rice in the three East African countries.

Indigenous seeds continue to thrive and contribute to a more diverse and resilient food system because of the efforts of the Ugandan National Agricultural Research Organization which has been researching and documenting indigenous crop varieties. The Tanzania Organic Agriculture Movement [TOAM] supports farmers in growing and marketing indigenous crops.

In Tanzania except for Maize, over 90% of seed is accessed via informal systems, including farmers' own stocks, social networks and informal markets. Local markets, serve as the core of farmer seed supply, some 51% of total smallholder seed. Farmer seed systems [FSS] and indigenous seeds play a crucial role in ensuring food security, agricultural biodiversity, and sustainable livelihoods for smallholder farmers worldwide.

Table 4: Importance of farm-saved seeds for major food crops in Kenya

Crop	Farm Saved Seeds [%]	Other source [%]	Rank	Other Source
Vegetable Seeds	78	22		Agrovet, Exchange
Vegetatively propagated	96	4		Market, Research
Cassava	93	7		Exchange, Research
Bananas	80	20		Exchange, Tissue Culture
Legumes	80	20	4	Market
Cow Peas	75	25		Research
Millet	90	10		Market
Sorghum	87	13		Breweries, KALRO
Maize	15	85	1	Agrovet
Wheat	?	?	2	
Potato	98	2	3	Gov / Kenya/Netherlands Seed Potato Development Project? Others

A study²⁸ summarized in Table 3 in Kenya by Ayieko and Tschirley, established that Smallholder farmers, whose farm size averages 0.2-3 hectares, account for 75% of the total agricultural output and 70% of marketed agricultural produce [GOK, 2010].

Only Kenya has shown indications of seed reform policies to better support FMSS and indigenous seeds. These reforms are expected to expand to include recognizing the rights of farmers to save, share, and exchange seeds.

The future of FMSS and indigenous seeds depends on the continued support of farmers, researchers, and policymakers. By working together, we can ensure that these vital systems continue to play a role in providing food security and agricultural biodiversity for generations to come.

A TOAM Study on FMSS in Tanzania summarized in Table 4 found that the Farmer Managed Seed System [FMSS] was the major source of seed in all agroecological zones in most of the crops grown²⁹. Generally, in all agroecological zones, it was found that seeds from FMSS were the most affordable [over 67%] and available [about 83%]. The results further indicated that seeds from FMSS were generally reliable although at different levels.

Table 5: Importance of farm-saved seeds for major food crops in Tanzania

Crop	Farm Saved Seeds [%]	Other source [%]	Rank	Importance
Maize	46	54% Commercial	1	Food and Income crop
Legumes	93	FMSS	2	Food and Income crop
Paddy Rice	99	FMSS	3	Food and Income crop
Cassava	95	FMSS	4	Food crop
Groundnuts	93	FMSS		Income crop
Sunflower	62	40% Commercial		Income crop
Vegetable Seeds	45	55% Commercial		Income crop
Other Crops	100-68	FMSS/Gov/NGO		Food crop

²⁸ Ayieko, M., & Tschirley, D. [2006]. Enhancing access and utilization of quality seed for improved food security in Kenya. ir-library.Egerton.ac.ke

²⁹ Farmer Managed Seed System in Tanzania [2015] - their operation, benefits, successes, challenges & support. Tanzania Organic Agricultural Movement [TOAM].

CHAPTER FOUR

International Seed Sector Frameworks

The Seed Sector Regulatory Framework (SSRF) across the world fall into four categories; Policies, legislations, Institutional arrangements and Standards and procedures.

Seed Policy outlines the government's vision, goals, and strategies for the seed sector. They address issues such as seed quality, variety development, intellectual property rights, farmer access to seeds, and market development.

Seed Legislation encompasses laws and regulations that govern the seed sector. They cover variety release and registration, seed certification and quality control, plant breeders' rights (Intellectual Property Rights-IPR), Seed production, marketing, and distribution and the import and export of seeds.

Institutional Arrangements designate responsible government agencies and bodies for implementing the framework. They include seed certification agencies, variety release committees, plant variety protection offices, and seed inspection services.

Lastly, standards and procedures, referred to as regulations establish technical guidelines and protocols for various aspects of seed production, testing, certification, and labelling and ensure seed quality and adherence to regulations.

The SSRF ensure seed quality and presumably protects farmers from pathogen-contaminated seeds that can negatively impact yields and incomes. According to Seed merchants, SSRFs are supposed to promote variety development and release.

The use of IPR is supposed to reward innovation in seed breeding by safeguarding breeders' rights to their varieties.

SSRF establish common standards and regulations to enable efficient seed movement across borders and in so doing facilitate seed trade.

The SSRFs in East Africa have been blamed for the lack of flexibility. The lack of adaptability is seen in Kenya, where the frameworks are unable to meet the evolving needs of the seed sector and address emerging challenges.

The SSRFs have established strong enforcement mechanisms for ensuring compliance with legislation provisions and presumably to maintain seed quality standards.

Effective SSRFs are developed and implemented through inclusive processes that involve all stakeholders. Seed Merchants have camped in exclusive camps dubbed Seed Traders Associations and comprised mainly breeders, seed producers, Industry, and academic researchers, and unfortunately -policymakers. Excluded from stakeholder involvement are smallholder and indigenous farmers including bodies that work closely with them to establish community seed Banks and capacity building.

The international seed sector regulatory framework is a patchwork of agreements, conventions, and guidelines established by various organizations to promote a harmonized global seed trade. It is a collection of instruments that work together to achieve common goals. These are

1. International Treaties and Conventions:

- International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA]: This treaty promotes the conservation and sustainable use of plant genetic resources for food and agriculture. It also establishes a multilateral system of access and benefit-sharing for plant germplasm, which is crucial for breeding new seed varieties.
- Convention on Biological Diversity [CBD]: This convention aims to conserve biological diversity and promote its sustainable use. It has several provisions relevant to the seed sector, such as the requirement to protect traditional knowledge associated with plant genetic resources.

2. Seed Schemes:

- Organisation for Economic Co-operation and Development [OECD] Seed Schemes: These schemes establish common standards for seed quality control and variety registration for member countries. They promote harmonization and facilitate the movement of seeds across borders, primarily for trade.

Kenya joined the Seed Scheme in 1961 and participated in the Fruit and Vegetables Scheme since 1994. Uganda joined the Seed Scheme in 2014. Tanzania is not currently participating in any OECD Seed Schemes.

- African Organisation for Standardization [AOAS] Seed Certification Scheme: This scheme provides voluntary standards for seed quality control and variety registration for African countries. It aims to improve seed quality and access for farmers in the region.

Kenya and Uganda, are full members of the scheme and have implemented the scheme's standards. Tanzania is an associate member of the scheme and is in the process of implementing the standards.

3. Guidelines and Recommendations:

- The Food and Agriculture Organization of the United Nations [FAO] plays a supporting role³⁰ in assisting member countries in developing and implementing their own national seed systems and regulations. This approach acknowledges the diverse needs and challenges faced by different countries. FAO Seed Regulations provides technical guidance and recommendations for developing and implementing national seed legislation and regulatory frameworks.

FAO has provided various tools and resources to guide countries in formulating effective seed regulations. Other than that, the ITPGRFA FAO has been instrumental in developing Codex Alimentarius³¹ as a set of international food standards which include some provisions on seed quality and safety. FAO has also published various documents offering guidance on specific aspects of seed systems such as the QDS³², and others on seed testing, certification, and quality control.

The International Seed Federation [ISF] Seed Trade Rules are not technically regulations, but rather a set of voluntary commercial terms and conditions established by the ISF to facilitate international seed trade. These rules address aspects like contract formation, product specifications, quality claims, payment terms, and dispute resolution. These rules provide a voluntary framework for international seed trade transactions. They aim to promote fair and transparent trade practices between seed companies. by providing a standardized set of terms and conditions for seed trade contracts, reducing ambiguity and potential misunderstandings between buyers and sellers. The rules establish minimum quality standards for traded seeds, promoting fair trade and protecting buyers from receiving substandard products. Additionally, the rules offer a streamlined mechanism for resolving trade disputes arising from contracts governed by the rules.

³⁰ <https://www.fao.org/seeds/en/>

³¹ <https://www.fao.org/fao-who-codexalimentarius/en/>

³² FAO. [2006]. Quality Declared Seed [QDS] System.

All seed trade leads to immense capital accumulation by corporations and IPR holders while using genetic resources which rightly belong to the peoples and the nations of the earth. Therein lies the genesis of all seed wars.

Table 6 *International Conventions that govern SSRF*

International Convention	Kenya	Uganda	Tanzania
a] Convention on Biological Diversity [CBD]	1992	1992	1992
b] Cartagena Protocol on Biosafety to the Convention on Biological Diversity	2003	2004	2003
c] International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA]	2004	2004	2005
d] International Union for the Protection of New Varieties of Plants [UPOV] -1991 Convention	2016	0000 ³³	2015
e] World Trade Organization [WTO- TRIPS article 27b]	1995	1995	1995

Part 1: International Frameworks Supportive of FMSS Best Practices

The United Nations Convention on Biological Diversity

The Convention on Biological Diversity [CBD], known informally as the Biodiversity Convention, is the most important multilateral treaty legally binding on the 196 member countries under the umbrella of the United Nations. The CBD contains provisions that protect farmers' rights to save, use, exchange, and sell farm-saved seeds. These rights are important for farmers because they allow them to maintain control over their own seeds and to continue to use traditional varieties of crops.

Convention on Biological Diversity Article 8j]

The Convention on Biological Diversity recognizes the dependency of indigenous peoples and local communities on biological diversity and their unique role in conserving life on Earth. This recognition is enshrined in the preamble of the Convention and its provisions. Under Article 8j] of the Convention, Parties have undertaken to

³³ It seems that Uganda's position regarding UPOV91 is uncertain. According to the records, the country has not yet officially joined the convention. Is it possible for Uganda to delay this decision and instead adopt a sui generis system that prioritizes the country's sovereignty and the interests of its farmers?

- a) respect, preserve and maintain the knowledge, innovations and practices of indigenous peoples and local communities relevant to the conservation of biological diversity and
- b) to promote their wider application with the approval of knowledge holders and to encourage equitable sharing of benefits arising out of the use of biological diversity.
- c) Furthermore, because of its relevance to the work of the Convention, considerations relating to the traditional knowledge of indigenous peoples and local communities are also being incorporated in all the programs of work under the Convention.

The United States of America is the only UN member state which has not ratified the Convention. The USA's refusal to ratify the CBD may be impacting negatively international efforts to conserve biodiversity and achieve worldwide farmers' rights to seeds including governance.

The CBD is a global agreement, and the USA's participation is seen as essential for its success. Without the USA's support, it may be more difficult to achieve the CBD's goals of conserving biodiversity and promoting sustainable development.

The Convention has three main goals: the conservation of biological diversity [or biodiversity]; the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources. Its objective is to develop national strategies for the conservation and sustainable use of biological diversity, and it is often seen as the key document regarding sustainable development.

The CBD has two supplementary agreements, the Cartagena Protocol and the Nagoya Protocol.

Cartagena Protocol on Biosafety and FMSS

The relationship between farmers' rights and the Cartagena Protocol on Biosafety is complex and multifaceted, with both potential conflicts and synergies.

Cartagena Protocol on Biosafety aims to safeguard traditional genetic resources by ensuring the safe handling and use of genetically modified organisms [GMOs] to minimize potential risks to biodiversity and human health, by specifically regulating the transboundary movement of living modified organisms [LMOs], including GMO seeds.

Navigating this interplay requires a critical approach that balances the perceived potential benefits of biotechnology with the protection of existing seed systems, the livelihoods of farmers, and the overall sustainability of agriculture.

Potential conflicts arise. GMO seeds are patented, restricting farmers' rights to save and share them, potentially undermining ITPGRFA and creating dependence on corporations. Equally, Biosafety assessments for LMOs might not always adequately consider potential impacts on farm-saved seed systems and local biodiversity.

A redeeming feature of the Cartagena Protocol is that it encourages information sharing and public participation in decision-making, which can empower farmers to have a say in issues related to seed and biosafety.

The International Treaty on Plant Genetic Resources for Food and Agriculture

■ ITPGRFA ■

The ITPGRFA or simply the Plant Treaty is a significant achievement in terms of promoting and strengthening indigenous and farmers' rights to seeds. The treaty provides several important protections for farmers and indigenous communities, and it is helping to create a more equitable system for the sharing of the benefits from the use of plant genetic resources.

The ITPGRFA promotes and strengthens indigenous and farmers' rights to seeds in the following ways:

- 1■ Recognition of farmers' rights: Article 9 of the ITPGRFA recognizes the right of farmers to save, use, exchange, and sell farm-saved seed, including the right to participate in plant breeding and other research on plant genetic resources. This is a significant step forward, as it is the first international treaty to explicitly recognize farmers' rights to seeds.
- 2■ Benefit-sharing: The ITPGRFA establishes a Multilateral System of Access and Benefit-sharing ■MLS■, which is a system for sharing the benefits from the use of plant genetic resources. Under the MLS, countries that provide access to their plant genetic resources are entitled to receive benefits, such as access to new technologies and products, and capacity building. This system is designed to ensure that farmers and indigenous communities who have contributed to the development and conservation of plant genetic resources can share in the benefits from their use.

- 3▯ Support for on-farm conservation and sustainable use: The ITPGRFA encourages countries to support farmers and indigenous communities in their efforts to conserve and sustainably use plant genetic resources on farms. This includes supporting community seed banks, seed fairs, and other initiatives that help farmers maintain access to a diverse range of seeds.
- 4▯ Protection of traditional knowledge: The ITPGRFA recognizes the importance of traditional knowledge for the conservation and sustainable use of plant genetic resources. The treaty encourages countries to take measures to protect traditional knowledge, such as by requiring users of traditional knowledge to obtain the prior informed consent of the holders of that knowledge and to share the benefits from the use of traditional knowledge fairly and equitably.
- 5▯ Promoting the participation of farmers and indigenous communities in decision-making: The ITPGRFA establishes several mechanisms for the participation of farmers and indigenous communities in decision-making on matters related to plant genetic resources. This includes participation in the Governing Body of the Treaty, the Access and Benefit-sharing Committee, and the Farmers' Rights Committee. This participation helps to ensure that the voices of farmers and indigenous communities are heard in decisions that affect their rights to seeds.
- 6▯ Building awareness of farmers' rights: The ITPGRFA secretariat works to build awareness of farmers' rights among farmers, indigenous communities, and other stakeholders. This includes developing educational materials, organizing workshops, and providing technical assistance. This awareness-raising is essential for ensuring that farmers and indigenous communities can claim their rights to seeds.

Nagoya Protocol on Access and Benefit-Sharing (ABS):

This international agreement aims to ensure that those who utilize genetic resources for research and development share the benefits with the communities and countries that provide them. It covers genetic resources from various sources, including plants, animals, and microorganisms.

However, there's ongoing debate about whether and how it applies to farmers' seeds, particularly those used for traditional agriculture and not commercial research. The relationship between farmers' rights and the Nagoya Protocol is still under negotiation and adaptation. It's crucial to strike a balance between ensuring fair and equitable access (for commercial breeding and researchers) and benefit-sharing for genetic

resources while safeguarding the rights and traditional practices of farmers who have stewarded these resources for generations.

From one point of view, ABS provide a platform to acknowledge and potentially strengthen Farmers' Rights within the international legal frameworks. Innovative approaches to benefit-sharing can be developed, such as supporting community seed banks, research collaborations, and capacity-building initiatives for farmers. The ABS protocol can transparency and stakeholder participation in decision-making. This can empower farmers to have a say in how their seeds and knowledge are used and to ensure their rights are respected.

However, the ABS protocol poses several challenges. The Protocol's language regarding the scope of genetic resources is open to interpretation. This can lead to uncertainty for farmers and potential restrictions on their traditional seed practices if national ABS measures are overly broad. Equally, ensuring equitable benefit-sharing with farmers for the use of their traditional knowledge and seeds can be challenging due to complex ownership issues and difficulties in tracing germplasm through breeding programs. Additionally, there are burdens to complying with ABS regulations that can create administrative problems for farmers, potentially hindering their ability to freely exchange and utilize seeds.

Despite these challenges, community protocols and biocultural protocols can be developed with AFSA and ABN partners to help farmers collectively assert their rights and negotiate under ABS agreements on their terms. Ongoing research and dialogues are needed to develop practical and effective approaches to ABS that support both conservation and the livelihoods of farmers.

UNDRIP and UNDROP frameworks

The United Nations Declaration on the Rights of Indigenous Peoples [UNDRIP [2007]] and The United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas [UNDROP [2018]] are two international human rights instruments relevant to farmers' rights to seed and biodiversity. The UNDRIP³⁴, adopted by the UN in 2007, recognizes the rights of indigenous peoples. Article 29 asserts their right to maintain, control, protect, and develop their traditional knowledge and cultural practices related to biological resources.

The UNDROP³⁵ is the first international instrument to affirm the human rights of peasants and other people working in rural areas. It recognizes their right to seeds, including the right to save, use, exchange, and sell their farm-saved seeds and propagating material, as well as to maintain, control, protect and develop their own seeds and traditional knowledge. Adopted by the United Nations General Assembly in 2018.

Differences between UNDRIP and UNDROP

UNDRIP is a more general instrument that covers the rights of all indigenous peoples, regardless of their occupation or livelihood. UNDROP is a more specific instrument that covers the rights of peasants and other people working in rural areas.

UNDRIP does not explicitly mention farmers' rights to seed and biodiversity, but it does recognize the right of indigenous peoples to conserve and use their traditional knowledge and cultural practices related to biological resources. UNDROP explicitly recognizes the right of peasants and other people working in rural areas to seeds, and it sets out several specific rights related to seed and biodiversity.

First adopted in 2007, UNDRIP enshrines the individual and collective rights of indigenous peoples. Notably, Article 29 empowers them to safeguard and utilize traditional knowledge related to biological resources, including their time-honoured seed systems. A decade later, UNDROP solidified the human rights of rural communities and peasants. Article 19 specifically grants them the right to seed, encompassing the

³⁴ United Nations General Assembly. [2007]. Declaration on the Rights of Indigenous Peoples. [Resolution adopted by the General Assembly on 13 September 2007, A/RES/61/295]. Retrieved from February 12, 2024

³⁵ United Nations General Assembly. [2018]. Declaration on the Rights of Peasants and Other People Working in Rural Areas [Resolution]. A/RES/73/165. <https://digitallibrary.un.org/record/1650694>

freedom to save, use, exchange, and sell farm-saved seeds and propagating materials, while fostering and protecting their ancestral knowledge.

While UNDRIP takes a broader approach, encompassing all indigenous peoples regardless of their occupation, UNDROP focuses more intently on the specific needs of peasants and rural populations. Despite this difference, both declarations ultimately converge on the critical issue of farmers' rights to seed and biodiversity. While UNDRIP implicitly acknowledges this right through the protection of knowledge and cultural practices, UNDROP takes a direct stance, explicitly outlining the rights related to seed and biodiversity for rural communities.

These declarations serve as a powerful foundation for governments to enact policies that uphold farmers' rights. The path forward includes recognizing and supporting farmer-managed seed systems, reforming intellectual property laws to guarantee they don't hinder these rights, facilitating access to public germplasm resources, strengthening enforcement mechanisms, investing in research and development for farmer-managed seed systems, raising awareness among policymakers and officials, and building capacity to implement supportive policies. By embracing these measures, governments can pave the way for a future where farmers' rights are protected and sustainable food systems flourish.

Part 2: International Frameworks against FMSS Best Practices

Capital accumulation while destroying nature: DUS vs. Biodiversity:

In sharp contrast to germplasm ownership by the commons, another set of global frameworks was crafted by the Agrochemical and seed industries and placed at the United Nations. These frameworks were made possible through complex negotiations at the World Trade Organization and take advantage of natural biological phenomena that prevent genetic resources from reproducing and diversifying.

The commercial seed industry uses the Acronym DUS to discriminate against indigenous and farmer-managed seeds which by nature display a rich array of diversity and would rarely meet the criteria the industry has set for distinctiveness, uniformity, and trait stability over several rain seasons. DUS guidelines are easily achieved when a breeder isolates one line of seeds and grows them through a cycle or more, often with inbreeding or controlled outbreeding techniques. The new lines so obtained are then made proprietary and registered as private property. This is how many breeders and corporations have amassed wealth from farmers' commons.

Inbreeding

Used by Breeders and corporations to amplify and lock in desired traits to create DUS

Inbred varieties are produced by mating closely related plants, such as siblings or parent-offspring. This process is repeated over several generations to produce a line of genetically identical plants. a They are very uniform in their characteristics, which makes them easy to manage and produce.

b They can be bred to have specific desirable traits, such as high yield, resistance to pests and diseases, or improved quality

c They are homozygous, meaning that they have two identical copies of each gene. This makes them more stable and less likely to be affected by environmental factors. a They can be less vigorous than outbred varieties, meaning that they may produce lower yields or be more susceptible to pests and diseases.

b They may be more susceptible to inbreeding depression, which is a decline in performance **that can occur when closely related plants are mated.**

Hybrid

Used by Breeders and Seed corporations. Two or more inbred lines are crossed and create DUS material from different backgrounds. The inbred lines are used to produce hybrid seeds [single crosses, double crosses, etc.]. The crossing of two genetically dissimilar plants or lines is called hybridization.

Selfing³⁶ reduces vigour or productivity, which is restored in the F1³⁷ generation.

a They are often more vigorous and productive than inbred or outbred varieties.

b They can be bred to have specific desirable traits, such as high yield, resistance to pests and diseases, or improved quality.

c c They can be used to improve the performance of inbred or outbred varieties.

a They are not uniform in their characteristics, so they may not be suitable for all applications.

d They cannot be saved and replanted, so farmers must buy new seeds each year.

³⁶ Selfing or self-pollination, where ovules are pollinated by the plant's own pollen, is the ultimate form of inbreeding or mating between relatives.

³⁷ The F1 generation is the first generation of offspring produced by a set of [usually very different] parents. The 'F' in F1 stands for 'filial.' So, in short, F1 means 'first filial generation'

- e□ They can be more expensive to produce than inbred or outbred varieties.

Outbreeding

Default by nature. Farmers are reliant on this technique because new unique planting materials are created every single growing season, under diverse growing environments.

Outbred varieties are produced by mating unrelated plants. This process can be done randomly or by selecting specific plants to mate. Outbred varieties are more genetically diverse than inbred varieties.

- a□ They are more vigorous than inbred varieties, meaning that they are more productive and less susceptible to pests and diseases.
- a□ They are less susceptible to inbreeding depression
- b□ They are more adaptable to different environmental conditions. a□ They are less uniform in their characteristics than inbred varieties. This can make them more difficult to manage and produce.
- c□ It can be more difficult to breed for specific desirable traits in outbred varieties.
- d□ Hybrid varieties are produced by crossing two inbred varieties. Hybrid varieties are often more vigorous and productive than either of their inbred parents. This phenomenon is known as heterosis. Hybrid varieties are often used in agriculture because they can produce higher yields and be more resistant to pests and diseases.

The choice of whether to use inbred, outbred, or hybrid varieties depends on the specific needs of the grower. Inbred varieties are often used for research and breeding purposes. Hybrid varieties are often used for commercial agriculture because they can produce higher yields and be more resistant to pests and diseases.

Distinctness: The variety must be distinguishable from any other known variety.

Uniformity: The variety must be sufficiently uniform in its relevant characteristics.

Stability: The variety must remain stable in its relevant characteristics after repeated propagation.

If a plant variety meets all three of the DUS criteria, it is eligible for plant variety protection? What Happened to the Term Newness / Novelty in Distinctness, Uniformity, and Stability □Dus□?

The term "newness" was originally included in the definition of a plant variety under the International Union for the Protection of New Varieties of Plants [UPOV] Convention. Newness meant that the variety must have been created or discovered and not commercialized for more than one year in any member state or for more than four years in any country.

However, the term "newness" was removed from the UPOV Convention in 1991. This was because it was difficult to enforce and it could create barriers to innovation. For example, if a breeder developed a new variety of plant, but it was already being commercialized in another country, the breeder would not be able to obtain plant variety protection in UPOV member states.

The removal of the term "newness" from the UPOV Convention means that plant varieties can now be protected even if they have already been commercialized in another country. This has made it easier for breeders to obtain plant variety protection and commercialize their new varieties.

However, the removal of the term "newness" has also led to some concerns. For example, some people worry that it could lead to the development of uniform varieties that are less resilient to pests and diseases. Others worry that it could lead to the monopolization of the seed market by a few large multinational corporations.

Overall, the removal of the term "newness" from the UPOV Convention has had a mixed impact. It has made it easier for breeders to obtain plant variety protection and to commercialize their new varieties. However, it has also led to some concerns about the potential negative impacts on biodiversity and the seed market.

In the context of the Distinctness, Uniformity, and Stability [DUS] criteria, the term "newness" is no longer relevant. The DUS criteria are used to determine whether a plant variety is eligible for plant variety protection. However, they do not consider whether the variety is new or not.

World Trade Organization [WTO- TRIPS article 27b]

The World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights [TRIPS] has several implications for food and seed rights and small-scale farmers in East Africa. TRIPS can have both negative and positive impacts, depending on how it is implemented. African countries need to use TRIPS flexibilities to protect the rights of small-scale farmers and to support farmer-managed seed systems

TRIPS require member countries to provide to commercial seed companies and breeders, intellectual property protection for plant varieties, including patents and plant variety protection [PVP]. This restricts farmers' ability to save, use, exchange, and sell farm-saved seed, without permission. This restricts farmers' access to seeds and makes it more expensive for them to produce food.

TRIPS encourage the development of new plant varieties that are, distinct, uniform and stable [DUS]. This has led to the loss of genetic diversity and the replacement of traditional varieties with commercial varieties making farmers more vulnerable to pests, diseases, and climate change.

Furthermore, TRIPS is more favourable to large corporate plant breeders than to small-scale farmers. This is because the costs of developing new plant varieties and obtaining plant variety protection are high. This can make it difficult for small-scale farmers to compete with corporate plant breeders and to develop new varieties that are adapted to their local conditions.

Under TRIPS there exists several flexibilities that countries can use to protect the rights of small-scale farmers. For example, TRIPS allow countries to exclude certain types of plants from patentability, such as plants that are essential for food security. It also allows for the development of sui generis PVP systems that are tailored to the specific needs of their countries. TRIPS also does permit compulsory licensing to allow the production of patented products without the permission of the patent holder.

Countries can also use TRIPS flexibilities to support farmer-managed seed systems. For example, countries can provide financial and technical support to farmer-managed seed banks and other seed-saving initiatives.

However, TRIPS flexibilities are not mandatory. Countries are free to choose whether or not to use them. Additionally, even if countries do use TRIPS flexibilities, they may face challenges in implementing them effectively. For example, countries may need to develop new laws and regulations, and they may need to provide training to farmers and other stakeholders.

TRIPS flexibilities have been used in African countries to support seed rights and small-scale farmers. Ethiopia has developed a sui generis PVP system that is tailored to the specific needs of the country. The system is designed to protect the rights of farmers and indigenous communities to their seeds and traditional knowledge.

UPOV Protecting indigenous and farmers' rights to seeds

The UPOV convention is the principal international agreement relating to intellectual property protection over plant varieties. Farmers and communities have identified, selected, bred and improved their germplasm for millennia, without recognition or pay. The imposition of the UPOV convention disregards these facts. UPOV attempts to offer some protection for farmers and communities are overlooked in favour of providing royalty rights to commercial stakeholders. The UPOV'78 concessions [farmers' privilege, breeder exemptions] are off the table in UPOV'91. Several countries have been hesitant to rush to sign onto the UPOV91 and remain only as UPOV78. These are Argentina, Trinidad and Tobago, Uruguay, South Africa, Portugal, Paraguay, Norway, Nicaragua, Mexico, Italy, Ecuador, Colombia, Brazil, Bolivia, New Zealand, and South Africa. OAPI operates a plant breeders' rights system which covers the territory of its 17 member States [member States of OAPI: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, Togo]; it is assumed that these countries adhere to the UPOV'91 convention.

It is important to find a balance between protecting the rights of plant breeders and ensuring that farmers have access to the seeds they need to produce food.

Breeders' exemption: The breeders' exemption allows farmers to save, use, exchange, and sell farm-saved seed of protected varieties for non-commercial purposes, such as replanting on their farms. This is an important right for farmers, as it allows them to maintain their seed supply and to adapt varieties to their local conditions.

Right to equitable benefit-sharing: The UPOV Convention recognizes that farmers have the right to equitable benefit-sharing from the use of their genetic resources and traditional knowledge. This means that farmers have the right to receive a fair share of the profits from the commercialization of products and technologies that are based on their genetic resources and traditional knowledge.

The preservation of traditional knowledge: The UPOV Convention encourages member states to take measures to protect the traditional knowledge of indigenous peoples and farmers. This can include measures to prevent the unauthorized use of traditional knowledge, to ensure that traditional knowledge is properly credited, and to share the benefits of using traditional knowledge with the indigenous peoples and farmers who created it.

In addition to these specific provisions, the UPOV Convention also promotes the development of new plant varieties that are adapted to the needs of farmers and indigenous peoples in developing countries. This is done through the UPOV Development Assistance Program, which provides training and support to plant breeders in developing countries.

The UPOV Convention is not a perfect system for protecting indigenous and farmers' rights to their seeds. Some critics argue that the UPOV Convention does not go far enough to protect farmers from the abuses of corporate plant breeders. However, the UPOV Convention does provide several important protections for indigenous and farmers' rights, and it is an important tool for ensuring that farmers have access to the seeds they need to produce food.

The UPOV Convention has been used to protect indigenous and farmers' rights to their seeds:

In 2016, the UPOV Council adopted a set of Guidelines on the Protection of Traditional Knowledge and Cultural Heritage in the Context of Plant Variety Protection. These guidelines guide UPOV member states on how to develop and implement laws and regulations that protect traditional knowledge and cultural heritage in the context of plant variety protection.

In 2019, the UPOV Council adopted a set of Guidelines on the Breeders' Exemption. These guidelines guide UPOV member states on how to implement the breeders' exemption in their national laws and regulations. The guidelines emphasize that the breeders' exemption is a fundamental right for farmers and that it should be interpreted broadly.

The UPOV Development Assistance Program has provided training and support to plant breeders in developing countries to develop new plant varieties that are adapted to the needs of local farmers. For example, the program has supported the development of new varieties of rice and maize that are resistant to pests and diseases, and that can tolerate drought and other climate stresses.

Kenya and UPOV Convention adoption; lack of public participation

Kenya was an early adopter of the UPOV'87 convention and should have resisted any pressure to update to the draconian UPOV91 convention. The earlier convention was adequate to meet the flower and horticulture industries to allow for continued exports

of Kenyan fruits and flowers to the EU. However, with inadequate public participation, KEPHIS and other regulators, in 2016 opted to update to the 1991 convention, presumable to appear to lead the region on matters core to them. No CSOs and farmers representing the Agroecology sectors were consulted. The request was also never submitted to any parliamentary or public consultation process.

Other countries with larger and more lucrative horticulture export industries have opted to stick to the UPOV78 convention which is more friendly. These countries include Argentina, South Africa, Portugal, Norway, Mexico, Italy, Ecuador, Brazil, and New Zealand.

UPOV91 Convention adopted in Tanzania despite CSO protests

Despite protestations³⁸ from the CSO networks in Tanzania. The authorities chose to sign the UPOV'91 convention in 2015. Several months before, the Tanzania authorities appeared to rush Zanzibar to adopt its Plant Breeders' Rights Bill is designed to satisfy UPOV'91 requirements and hasten Tanzania's entry into this intellectual property legal framework.

Ten Civil society networks questioned the entire process claiming it was non-participatory and meant to shut out the very farmers the Bill purportedly benefits. They also expressed their concerns that farmers' organizations and relevant civil society organizations were not consulted on the Plant Breeders' Rights Bill for Zanzibar.

By adopting the UPOV91 convention, Tanzania chose to forgo all the safeguards and exemptions accorded to local breeders and poor farmers in underdeveloped countries were provided for under TRIPs and UPOV. From 2010 to 2016 several Agricultural investment projects were ongoing including The Scaling Up Agricultural Output and Productivity in Tanzania [SAGOT] project which was a five-year, USD 120 million project implemented by the International Fund for Agricultural Development [IFAD]³⁹. More pressure⁴⁰ may have come from the investments from the Southern Agricultural Growth

³⁸ <https://www.twm.my/title2/susagri/2013/susagri253.htm>

³⁹ Engström, L., & Hajdu, F. [2019]. Conjuring 'Win-World'—resilient development narratives in a large-scale agro-investment in Tanzania. *The Journal of Development Studies*, 55(6), 1201-1220.

⁴⁰ Tups, G., & Dannenberg, P. [2021]. Emptying the future, claiming space: The Southern agricultural growth corridor of Tanzania as a spatial imaginary for strategic coupling processes. *Geoforum*, 123, 23-35.

Corridor of Tanzania “SAGCOT”, which is a Public-Private Partnership initiated at the World Economic Forum “WEF” Africa “WEFA” Summit in Dar es Salaam in 2010.

Its implementation period runs for 20 years up to 2030. Its ultimate objective is to boost agricultural productivity, improve food security, and reduce poverty.

The current seed policies and legislation in Tanzania are largely silent on the issue of smallholder farmers⁴¹. Senior government officials claim that the new legislation is aimed at the ‘commercial’ farming sector, and will not impact smallholder farmers. The focus is on the commercialization of agriculture, and the provision of a conducive policy environment for foreign direct investment in seed breeding and distribution.

Which way Uganda: Sui generis vs. UPOV91 Convention adoption?

Uganda is the only country in East Africa which has put in place operational procedures to guide the establishment of community seed banks in harmony with the national policies and the spirit of the Plant Treaty⁴². This is despite the lack of an overarching law such as is in the Kenya constitution, where genetic resources are recognized as the heritage and wealth of her people. The Ugandan President Museveni is on record sending back to legislators the Plant Breeders' Bill, 2019. His objections related to the blanket inclusion of UPOV standards on intellectual property rights, the way access to genetic resources was handled, and the potential negative impacts on farmers by the proposed Bill⁴³. The Plant Breeders' Bill was eventually passed into law in 2021 with revisions.

However, Uganda is not a member of the UPOV convention as of February 2024, nearly three years later. To find an acceptable compromise between the President’s objections and the UPOV convention, Ugandans may yet have an opportunity to amend this act as a sui generis law in several situations:

- When existing intellectual property “IP” frameworks are inadequate: Traditional IP systems like patents and copyrights often don't fit well with the unique characteristics of plant varieties and the needs of small farmers and local

⁴¹ Farmer Managed Seed System in Tanzania “2015” - their operation, benefits, successes, challenges & and support. Tanzania Organic Agricultural Movement “TOAM”.

⁴² Zephania Ubwani “2023”. Why East Africa farmer groups are opposing new seeds plan The Citizen Newspaper publication Monday, June 19, 2023 copy courtesy Emmanuel Justine, a program manager with Eastern and Southern Africa Small Scale Farmers Forum “ESAFF”

⁴³ Rock, J., & Schurman, R. “2020”. The complex choreography of agricultural biotechnology in Africa. *African Affairs*, 119(477), 499-525.

communities. Sui generis systems can address these gaps by providing tailored protection for genetic resources and traditional knowledge.

- To protect biodiversity and traditional agriculture: Sui generis systems can be designed to promote the conservation and sustainable use of biodiversity by recognizing the contributions of local communities and traditional agricultural practices. They can also help to prevent the erosion of genetic diversity by encouraging the cultivation and exchange of traditional varieties.
- To ensure equitable benefit sharing: Traditional knowledge and genetic resources often originate from indigenous and local communities. Sui generis systems can help to ensure that these communities receive fair and equitable benefits from the use of their resources.
- To address specific national priorities: Countries may have specific goals for their plant variety protection systems, such as promoting food security, poverty reduction, or rural development. Sui generis systems can be tailored to meet these specific goals.

Uganda would not be alone because the sui generis systems have been used elsewhere successfully. The Andean Community Decision 344 is a regional sui generis system that protects the rights of indigenous communities in the Andean region of South America to their traditional knowledge and genetic resources.

Table 7: *A Comparison of Sui Generis systems and the UPOV Convention*

Feature	Sui Generis Systems	UPOV Convention
Complexity and Inconsistency	Complex and time-consuming to develop and implement, inconsistent across countries	Less complex and more consistent across member states
Recognition and Enforcement	Limited recognition and enforcement, especially in developed countries	Widely recognized and enforced
Expertise and Infrastructure	Requires specialized expertise and infrastructure	Less demanding in terms of expertise and infrastructure
Focus	Focuses on traditional knowledge, biodiversity, and farmer's rights	Focuses on the commercial interests of plant breeders
Impact on Traditional Knowledge and Farmer's Rights	Potential threat to traditional knowledge and farmer's rights due to privatization of resources and limited seed exchange	Less impact on traditional knowledge and farmers' rights, but some concerns remain
Administrative Costs	High administrative costs, especially for developing countries	Lower administrative costs, but still required

The Indian Biodiversity Act, of 2002 is also a sui generis system that recognizes the rights of communities to their biodiversity and traditional knowledge. The Farmers' Rights Act, 2001 of the Philippines is equally a sui generis system that protects the rights of farmers to save, use, exchange, and sell seeds.

The president's objections to passing the initial Plant Breeders' Bill, 2019 were justified. Instances exist where the UPOV Convention has been used to hurt indigenous and farmers' rights to seeds. These include

- In 2005, the UPOV Council adopted a set of Guidelines on Utility and Essentially Derived Varieties. These guidelines have been used to argue that even small changes to a protected variety should be considered an infringement of the plant breeder's rights. This could make it difficult for farmers to develop new varieties based on existing protected varieties.
- In 2012, the UPOV Council adopted Guidelines on Examination of Newness/ "novelty", Distinctness, Uniformity and Stability – "nDUS"
- . These guidelines have been criticized for making it more difficult for traditional varieties to be granted plant variety protection. This is because traditional varieties are often heterogeneous and not as uniform as commercial varieties.
- The UPOV Development Assistance Program has been criticized for focusing too much on the development of commercial varieties and not enough on the development of varieties that are adapted to the needs of small-scale farmers in developing countries.

CHAPTER FIVE

Regional Seed Frameworks

Regional Seed Frameworks in Africa are policies and initiatives that aim to harmonize seed regulations and trade among African countries. They are designed to improve commercial seed quality, availability, and access for farmers, and to promote food security and agricultural development in the region.

These regional frameworks are supported by various organizations and stakeholders, such as the African Seed Trade Association [AFSTA], the African Union [AU], the Syngenta Foundation for Sustainable Agriculture [SFSA], and others⁴⁴. However, the implementation of these frameworks faces some challenges, such as the need for national legislation and regulation, the capacity of institutions and regulators, and the coordination among different regional bodies⁴⁵.

1 The Swakopmund Protocol Africa is endowed with a wide and varied range of biological resources and a deep-rooted knowledge of their management and use. This not only reflects the cumulative body of knowledge and beliefs handed down through the generations but also the intimate relationship of local people to their environment. The Swakopmund Protocol, adopted in August 2010, is underpinned by the principle that the knowledge, technologies, biological resources, and cultural heritage of traditional and local communities are the result of tested practices of past generations. These resources are held in trust by today's custodians for future generations.

The Swakopmund Protocol was signed by nine ARIPO member states, namely, Botswana, Ghana, Kenya, Lesotho, Liberia, Mozambique, Namibia, Zambia, and Zimbabwe. The Protocol affirms the principle that traditional or local communities are the custodians of their TK, its associated Genetic Resources, and Traditional cultural expressions, and empowers them to exercise rights over their knowledge and resources.

⁴⁴ Kuhlmann, K. [2015]. Harmonizing regional seed regulations in sub-Saharan Africa: a comparative assessment. Available at SSRN.

⁴⁵ Gaffney, J., Anderson, J., Franks, C., Collinson, S., MacRobert, J., Woldemariam, W., & Albertsen, M. [2016]. Robust seed systems, emerging technologies, and hybrid crops for Africa. *Global Food Security*, 9, 36-44.

The Protocol recognizes the need to respect, recognize, and protect Africa's abundant multi-ethnic character, as well as its rich cultural heritage and TK. It further articulates and amplifies the shared position of African countries relating to collective or community rights and the sharing of benefits accruing from the commercial exploitation of their biological resources, TK, and TCEs.

Toothless Protocol

The Swakopmund Protocol only covers TK and TCEs. Its developers chose not to address IP issues about access to and sustainable use of Genetic Resources as these require a holistic approach that encompasses environmental concerns, as stipulated in the Convention on Biological Diversity [CBD]. As a system of protection, the Swakopmund Protocol has been found inadequate for protecting Traditional knowledge, and as a result, there is a need for African Countries to develop their own national sui generis system for protecting TK.

2] The Common Market for Eastern and Southern Africa [COMESA] Seed Trade

Harmonization Program: The COMESA Seed Trade Harmonization Program aims to harmonize seed trade regulations among COMESA member states. This will facilitate the cross-border movement of seeds and help to improve seed quality and availability in the region.

COMESA Seed Trade Harmonisation Regulations, 2014 The Common Market for Eastern and Southern Africa [COMESA], a regional trading bloc of 21 countries, enacted the Seed Trade Harmonisation Regulations in 2014. The regulations were developed to enhance seed production, seed trade, and reliability, and increase competitiveness of the seed industry in the COMESA region. Through these regulations, a COMESA seed certification, variety release, and phytosanitary system are created. The primary objectives of the COMESA Regulations are to harmonize phytosanitary measures for seed in the region, ensure the varieties listed in the Variety Catalogue and traded are of high quality, and, encourage investment in the seed business among others. Four classes of seed are established: pre-basic seed; basic seed; first-generation certified seed.

The COMESA regulations are framed in a manner that does not enable the trading of varieties not tested, released, or registered in the COMESA Catalogue. Indigenous varieties of many crops in the COMESA countries are not registered. It is also worthy to note that 19 of the 21 COMESA countries have adopted the Regulations. While a COMESA country can sustain two separate and parallel systems for testing,

registration, and release of seed to also ensure the availability of clean seed of indigenous varieties “through the ‘quality declared seed’ system” such a system is likely to add more costs to accessing seed which is likely to have income and livelihood implications.

- 3 **The African Seed and Biotechnology Partnership Program** “ASBPP”: The ASBP is a continental initiative that aims to improve the availability and accessibility of high-quality seeds and biotechnology products to African farmers. The ASBP specifically recognizes the importance of integrating commercial/Industrial and farmer-managed seed systems in Africa leveraging on the principles of plurality and Integrated Seed System Development “ISSD”, contributing to CAADP processes leading to access to quality seed.

The ASBP is implemented by the African Union Commission in collaboration with several partners, including the New Partnership for Africa's Development “NEPAD” and the Alliance for a Green Revolution in Africa “AGRA”. The African Union “AU” Department of Rural Agriculture, Rural Development, Blue Economy & Sustainable Environment “DARBE” mandated the Forum for Agricultural Research in Africa “FARA” to serve as the Secretariat of the African Seed and Biotechnology Partnership Platform “ASBPP”.

- 4 **The EAC Food Security Action Plan** “FSAP” was adopted by the East African Community “EAC” in 2011. The FSAP aims to improve food security and nutrition in the EAC region by increasing agricultural productivity, improving market access for farmers, and reducing food waste.
- 5 **The EAC Agricultural and Rural Development Policy** “EAC-ARDP” was adopted by the EAC in 2012. The EAC-ARDP aims to promote sustainable agricultural development and food security in the EAC region by increasing agricultural productivity, improving market access for farmers, and supporting rural development.
- 6 **The EAC Seed and Plant Varieties Bill** was adopted by the EAC in 2018. The EAC Seed and Plant Varieties Bill aims to harmonize seed regulations in the EAC region and to facilitate the movement of seeds across borders. The EAC Seed Harmonization Initiative is a project aimed at harmonizing seed regulations in the EAC region. The EAC Seed Harmonization Initiative is being implemented by the

African Seed Trade Association [AFSTA] and the Eastern African Farmers Federation [EAFF].

The EAC Seed and Plant Varieties Bill was adopted by SCAFs in December 2018 and has already been cleared by the Sectoral Council on Legal and Judicial Affairs. The next steps will entail approval by the Council and enactment into law by the East African Legislative Assembly. The scope of the Bill applies to the coordination, release, and registration of plant varieties between Partner States; common processes for seed certification and protection of plant varieties within the Community and other related matters. Robust administrative arrangements have been spelt out to ensure enhanced coordination and cooperation among Partner States.

The Bill makes provision for the Council of Ministers to establish a seed and plant variety evaluation committee and designation of national seed authorities and national plant variety committees. Other key areas that will be addressed include the establishment of national and Community plant variety catalogues, seed certification, testing and marketing based on common understanding and application of harmonized procedures within the Community.

The EAC Seed and Plant Varieties Bill and the Arusha Protocol for the Protection of New Varieties of Plants are both relevant to plant varieties and intellectual property rights in Africa, but they have distinct differences:

Table 8: A comparison of the two major regional seed legislations in East Africa

Feature	Arusha Protocol for the Protection of New Varieties	EAC Seed and Plant Varieties Bill
Scope	This is a broader, regional agreement covering 19 member states of the African Regional Intellectual Property Organization [ARIPO]. It focuses on granting and protecting Plant Breeders' Rights [PBRs] for new plant varieties across the member states.	This document specifically focuses on the East African Community [EAC] region. It aims to harmonize seed and plant variety regulations across its member states. It addresses seed certification, release, and registration of plant varieties, and establishes administrative structures for implementation.
Focus	Seed quality, certification, variety registration, PBRs	Plant Breeders' Rights [PBRs]
Content:	Broad , also covers seed regulations It goes beyond PBRs and covers seed quality standards, certification systems, regional	Specific to PBRs. It outlines the criteria for granting rights, the scope of protection, and enforcement mechanisms

Feature	Arusha Protocol for the Protection of New Varieties	EAC Seed and Plant Varieties Bill
	variety testing and registration, and facilitation of seed trade within the EAC.	
Potential impact	May promote investment in plant breeding in Africa but raises concerns about potential negative impacts on farmers' access to and use of seeds, particularly for traditional varieties.	Aims to improve regional seed availability, trade, and agricultural productivity while also addressing concerns about farmer rights and access to seeds.
Status	Adopted, not yet in force. While adopted in 2015, it hasn't entered into force as it requires ratification by four member states. Currently, only two have ratified it.	Draft, not yet enacted as of February 2024. It is still under review and not yet enacted.

7▯ The Arusha Protocol for the Protection of New Varieties of Plants

Heavily pushed by ARIPO in Anglophone Africa, the Arusha Protocol is a legal agreement aimed at establishing a regional system for protecting breeders' rights in Africa. It was adopted in July 2015 and aims to harmonize national plant variety protection (PVP) laws with the International Union for the Protection of New Varieties of Plants (UPOV) Convention of 1991. This harmonization facilitates the protection of new *commercial* plant varieties across participating countries, fostering innovation and investment in plant breeding of industrial Agriculture.

The Arusha Protocol empowers breeders with exclusive control over their creations, allowing them to manage the production, sale, and marketing of their protected varieties for at least 20 years. To ensure fairness and consistency, the system defines clear criteria for granting these rights, including novelty, distinctiveness, uniformity, and stability. Additionally, it streamlines application and administrative procedures across the region. This harmonization is facilitated by a dedicated regional PVP office housed within the African Regional Intellectual Property Organization (ARIPO), serving as the central hub for managing the system and fostering innovation in African agriculture.

Current Status:

The Arusha Protocol has not yet entered into force, requiring ratification by four member states. As of February 2024, five countries, namely Burkina Faso, Eswatini, Lesotho, Malawi, and Rwanda have signed the Protocol but none of them in the 19-plus member states Body have ratified it, since July 6th, 2015.

The stated potential benefits of the Arusha Protocol are the same as stated by the parent UPOV body. The Arusha Protocol empowers breeders with exclusive control over their creations, setting clear criteria for protection and streamlining application/administration across regions.

It is fascinating that Burkina Faso a non-anglophone state, was corralled to sign onto the Arusha protocol. Equally intriguing is that no other country in the ARIPO territory has ever ratified the protocol.

Challenges and Concerns:

Limited awareness of the Arusha Protocol and its benefits persists among stakeholders, alongside capacity-building needs in participating countries to implement it effectively.

Concerns about potential impacts on farmers' access to seeds and traditional practices are growing, highlighting a complex landscape where education, empowerment, and preservation of indigenous knowledge are essential for navigating agricultural governance and sustainable development. The implementation of any UPOV Protocol should be interpreted as a heavy-handed imposition by the WIPO body on African countries to adopt punitive plant and variety protection legislation. UPOV is to be avoided and any new sign-on should be handled with suspicion.

8. **The East African Community (EAC) Seed Harmonization Program**⁴⁶ is yet another initiative aimed at creating a unified system for seed regulations and policies across the six member states of the EAC: Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda. The objectives of the program are listed as to boost regional seed trade and encourage investment in the seed sector.

The program also has had the opportunity to grapple with the Plant Treaty as a stumbling block. The program did recognize the need to have a clear regime of access and benefit sharing and the need to improve the capacity for identification, documentation and conservation of plant genetic resources belonging to the member states and their farmers. Concerns about potential impacts on farmers' access to seeds and traditional practices have been aired with some stakeholders expressing concerns

⁴⁶ http://repository.eac.int/bitstream/handle/11671/1992/ES_Issue4-20-22%20EAC.pdf?sequence=1&isAllowed=y accessed online Fe2/13/24.

that the program could lead to higher seed prices or restrictions on the use of traditional seed varieties.

9. The Southern African Development Community (SADC) Seed Harmonization Program aims to harmonize seed trade regulations among SADC member states. This will facilitate the cross-border movement of seeds and help to improve seed quality and availability in the region.

Tanzania is the only member of SADC from East Africa. By harmonizing seed trade regulations, facilitating the cross-border movement of seeds, and promoting the development and use of commercial and Hybrid seeds, these frameworks are being used by East African governments as potential pathways to improve food security and nutrition in Africa.

The SADC Seed Harmonization Program skirts away from giving overt Plant Breeder protection. These aspects are left to UPOV-modeled laws. The Arusha Seed Protocol like the SADC Seed Harmonization program initiative, aims to enhance seed trade and agricultural development in Africa, but its main bite is in providing for UPOV Seed (commercial) breeders' protection rights.

Tanzania is also set to be bound by the EAC Seed legislation. This Country therefore is trending in a very complex Seed legislative environment and so far, there are no signs of protecting the rights of smallholder farmers. Uganda, on the other hand, is holding back, especially on the laws that grant commercial breeder protection for industrial seeds. Of the three East African countries, Uganda is the only one where smallholder seed rights have an opportunity to flourish.

Why ABN Members must be concerned about UPOV IPR Regimes

The intellectual property concerns raised by all ARIPO-modelled laws have several negative consequences for indigenous and farmers' rights to seeds that ABN member organizations ought to be aware of.

1. **Patenting of seeds:** The patenting of seeds can restrict farmers' access to seeds and make it more expensive for them to produce food. This is because patent holders have the exclusive right to produce, sell, and use their patented varieties.
2. **Plant variety protection (PVP):** PVP laws grant plant breeders exclusive rights to their varieties for at least 20 years. This can also restrict farmers' access to seeds, especially if PVP laws are interpreted broadly. Farmers may lose access to seeds that

they have traditionally used and adapted to their local conditions. This can make them more vulnerable to pests, diseases, and climate change.

- 3▯ **Biopiracy:** Biopiracy is the unauthorized taking or use of biological resources, such as seeds, traditional knowledge, and genetic information. Biopiracy can deprive indigenous and farmers' communities of the benefits from their resources.
- 4▯ **Misappropriation of traditional knowledge:** Traditional knowledge is the knowledge that indigenous and farmers' communities have developed over generations about how to manage and use plant genetic resources. Traditional knowledge can be misappropriated by biotechnology companies and other organizations without consent or benefit-sharing with the communities that developed it.
- 5▯ **Loss of control over seed systems:** Farmers may become more dependent on seed companies and other organizations for their seeds. This can reduce their control over their seed systems and make them more vulnerable to exploitation.
- 6▯ **Loss of cultural heritage:** Indigenous and farmers' communities have a deep cultural connection to their seeds. The intellectual property concerns listed above can threaten this cultural heritage and lead to the loss of traditional knowledge and practices.
- 7▯ **Concentration of seed ownership:** The global seed industry is becoming increasingly concentrated, with a few large companies controlling the majority of the market. This concentration of seed ownership can reduce farmers' choices and make them more dependent on a small number of companies for their seeds.
- 8▯ **Increased costs of production:** Farmers may have to pay higher prices for seeds, which can increase their costs of production and reduce their profits.

Countering UPOV-modelled laws in East Africa

It is possible to protect indigenous and farmers' rights to seeds and to create a more equitable system for the sharing of the benefits from the use of plant genetic resources. Intellectual property concerns are not insurmountable. Several legal and policy measures can be taken to protect indigenous and farmers' rights to seeds. ABN Members must be at the front in doing the following;

- 1▯ **Strengthening farmers' rights legislation:** Farmers' rights legislation can be used to protect farmers' right to save, use, exchange, and sell farm-saved seed.
- 2▯ **Developing sui generis PVP systems:** Sui generis PVP systems are PVP systems that are tailored to the specific needs of indigenous and farmers' communities.

These systems can help to protect the rights of indigenous and farmers' communities to their seeds and traditional knowledge.

- 3▢ **Preventing biopiracy:** Several legal and policy measures can be taken to prevent biopiracy, such as requiring companies to obtain the prior informed consent of indigenous and farmers' communities before using their resources and sharing the benefits from the use of those resources fairly and equitably.
- 4▢ **Promoting the protection of traditional knowledge:** There are several ways to promote the protection of traditional knowledge, such as developing laws and regulations that recognize and protect traditional knowledge, and supporting indigenous and farmers' communities in documenting and protecting their traditional knowledge.
- 5▢ **Supporting community seed banks and other seed-saving initiatives:** Community seed banks and other seed-saving initiatives can help farmers to maintain access to a diverse range of seeds and to adapt seeds to their local conditions.

CHAPTER SIX

National Seed Frameworks

National Seed Sector Frameworks are comprehensive policies or strategies established by governments to regulate and guide the development, production, distribution, and management of seeds within a country. These frameworks typically encompass various aspects of the seed sector, including seed quality control, certification, registration, breeding, production, marketing, and conservation. National Seed Sector Frameworks play a crucial role in promoting agricultural development, food availability, and rural engagement in Agriculture. These legislations concern themselves with seed utilization [exploitation].

However, Seed does not come from vacuum or commercial Breeders laboratories. It is first a portion of the sovereign territory's genetic heritage. In this case, the National Seed Sector frameworks must therefore encompass the seeds' biological characteristics [such as the type of seed, its unique genetic properties, and its origin] and Its socio-cultural and legal context [Who has rights over the seed, what traditional knowledge is associated with it, and how can its use be managed in a way that respects sovereignty and promotes fair benefits]. These legislations concern themselves with Seed recognition and preservation.

The three East African countries are at various stages in the development of their National Seed Sector Frameworks. With the support of commercial Seed sector partners, Kenya is at the most advanced stage in creating an enabling environment for seed utilization legislation. Compared to Uganda and Tanzania, Kenya Indeed is seen as a model where the commercial seed industry has been well supported by laws that enable seed investors to make profits from the Agrochemical and seed enterprises. However, with the constitution of Kenya from 2010, a new dispensation in the setting of the National Seed sector frameworks has elevated the need to now develop legislation to recognise and preserve local genetic heritage as a sovereign territory.

Uganda has made several attempts to enact legislation for Seed recognition and preservation. President Museveni...

Kenya Seed Sector Frameworks

The Constitution of Kenya [2010] also has two relevant provisions:

- 1[Article 11[3][b] — “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.”
- 2[Article 69[1][a] — “The state shall ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits.”

What are the criticisms against The Kenyan Seed and Plant Varieties Act [2012]

The Kenyan Seed and Plant Varieties Act [2012] has been criticized for several reasons, including:

It undermines farmers' rights to seed and biodiversity. The Act introduces several restrictions on farmers' ability to save, use, exchange, and sell seeds. For example, farmers are prohibited from selling seeds of protected varieties without the permission of the breeder. This is particularly problematic in Kenya, where farmers have traditionally relied on saved seeds for a significant portion of their planting material.

It favours the Commercial [Industrial] seed sector over farmer-managed seed systems. The Act is heavily biased towards the formal seed sector, with little or no recognition of farmer-managed seed systems. This is even though farmer-managed seed systems play a vital role in food security and agricultural resilience in Kenya.

It is too restrictive on the introduction of new plant varieties. The Act requires breeders to obtain a license from the government before they can introduce a new plant variety into Kenya. This process can be time-consuming and expensive, and it can discourage breeders from developing and introducing new varieties that are adapted to Kenyan conditions.

It is not well enforced. The government has not done enough to enforce the provisions of the Act, particularly those that protect farmers' rights. This has left farmers vulnerable to exploitation by the Commercial [Industrial] seed sector and other powerful actors.

In addition to these criticisms, the Kenyan Seed and Plant Varieties Act [2012] has also been criticized for the following:

It was developed without adequate consultation with farmers and other stakeholders. This has led to several unintended consequences, such as the restrictions on farmers' rights to seed and biodiversity.

It is inconsistent with international law, particularly the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA]. The ITPGRFA recognizes farmers' rights to seed and biodiversity, and it requires countries to implement policies that support farmer-managed seed systems.

The Kenyan Seed and Plant Varieties Act [2012] is a flawed piece of legislation that does not adequately protect farmers' rights to seed and biodiversity. The Kenyan government needs to review and revise the Act to ensure that it is aligned with international law and that it supports the sustainable development of agriculture in Kenya.

Although not formally registered as seed producers, farmers produce seeds of most open-pollinated varieties of cereals and grain legumes, and they reproduce crops vegetatively. Farmers procure hybrid maize from private and public companies and rice from public companies. Other important ways in which farmers' seed systems are connected to the Commercial [Industrial] system are through several participatory crop improvement projects and the acquisition by farmers of improved varieties from government demonstration and experimentation fields

Intellectual Property rights [IP Rights] are the rights given to persons over the creations of their minds. They are a form of property granted that enables the owner to exercise a monopoly on the subject of the Intellectual Property rights and comprise a set of exclusive rights to exclude others from making, copying or using certain intangible creations for a certain period.

They are not only aimed at protecting the innovative and creative capacity of owners of Intellectual Property and promoting competition in various industries but also have to do with the welfare of the consumers of the goods and services to which they apply.

Why seed sharing is illegal in Kenya?

In a bid to protect farmers from “bad seeds”, the Kenyan government introduced The Seed and Plant Varieties Act [2012], which prohibits anyone from sharing, exchanging, or selling uncertified and unregistered seeds.

The Kenyan Seed and Plant Varieties Act [2012] is a flawed piece of legislation that does not adequately protect farmers' rights to seed and biodiversity. The Kenyan government needs to review and revise the Act to ensure that it is aligned with international law and that it supports the sustainable development of agriculture in Kenya by including FMSS and indigenous Seeds in line with the provisions called for in the CoK 2010 article 11 3: b.

The Kenyan Seed and Plant Varieties Act [2012] has been criticized for several reasons, including:

- 1[It undermines farmers' rights to seed and biodiversity. The Act introduces several restrictions on farmers' ability to save, use, exchange, and sell seeds. For example, farmers are prohibited from selling seeds of protected varieties without the permission of the breeder. This is particularly problematic in Kenya, where farmers have traditionally relied on saved seeds for a significant portion of their planting material.
- 2[It favours the Commercial [Industrial] seed sector over farmer-managed seed systems. The Act is heavily biased towards the Commercial [Industrial] seed sector, with little or no recognition of farmer-managed seed systems. This is even though farmer-managed seed systems play a vital role in food security and agricultural resilience in Kenya.
- 3[It is too restrictive on the introduction of new plant varieties. The Act requires breeders to obtain a license from the government before they can introduce a new plant variety into Kenya. This process can be time-consuming and expensive, and it can discourage breeders from developing and introducing new varieties that are adapted to Kenyan conditions.
- 4[It is unenforceable. The government has not done enough to implement the provisions of the Act, particularly those that protect farmers' rights. This has left farmers vulnerable to exploitation by the Commercial [Industrial] seed sector and other powerful actors.
- 5[Public participation and consultation with farmers and other stakeholders, was inadequate when this Act was developed and passed through parliamentary legislation in 2012. This has led to several undesirable socio-economic consequences, such as the restrictions on farmers' rights to seed and biodiversity.
- 6[It is inconsistent with international law, particularly the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA]. The ITPGRFA

recognizes farmers' rights to seed and biodiversity, and it requires countries to implement policies that support farmer-managed seed systems.

70 It is inconsistent with UNDRIP and UNDROP frameworks

Amendments to the Seed Protection Act of 2012 by inserting Farmers' rights

Kenya as a signatory to the UN conventions [CBD] and the Plant Treaty [IPTGRFA] has in place GeRRI which under Section 27 [a] of the amended Seed and Plant Variety Protection Act of 2016. GeRRI assumes the responsibility of protecting genetic heritage related to Food and Agriculture.

The enactment of the Constitution in 2010, devolved agricultural functions to the counties, and created an impetus for the development of new laws, which are skewed towards the Commercial [Industrial] seed system. The government of Kenya and key stakeholders in the Commercial [Industrial] seed system led reforms to benefit commercial industrial agriculture and the corporate seed system. These reforms were largely negative to indigenous and farmers' rights to seeds.

The Seeds and Plant Varieties [Plant Breeder's Rights] Regulations, 2021

The Seeds and Plant Varieties [Forest Tree Seeds] draft regulations, 2021

With these regulations, how the seeds were collected, multiplied, shared, exchanged, and sold, is changed. The activities are now controlled to a greater extent by the State; even so, farmers' activities concerning these seeds/seedlings are now criminalized. All actors are required to register as legal entities [seed collectors, seed stockiest [bulking seeds], seed merchants] and failure to comply will result in a fine. These regulations therefore continue to shrink the space of the informal seed systems and set high-level requirements for seed exchange and sale, which can hardly be met by farmers, including the requirement to register as legal entities.

Standard Seeds instead of QDS proposed by the Commercial Seed Industry.

The Ministry of Agriculture, in collaboration with KEPHIS and STAK, concerned about very low seed volumes of non-maize crops, proposed an amendment to the Seeds Regulations [2016] to include an enhanced category of Standard Seed⁴⁷. Standard Seed is defined as that "meets the minimum laboratory and post control standards for

⁴⁷ <https://www.stak.or.ke/standard-seed/>

categories of crop as set by KEPHIS and is a progeny of certified 2nd generation or certified Standard Seed or by declaration by the Cabinet Secretary.”

The idea of Standard Seed instead of Certified Seed is an industry ploy to get to market for sale, seed that can not pass phytosanitary regulations, but can be sold for additional income for STAK members. It is important to note that FMSSs can never meet this category. By definition, Standard seeds originate from the industry as it was once certified seed.

The proposed Standard Seed category has been passed on to agroecology players in forums. It is hoped that as the voices of agroecology strategists become stronger, a similar push would be acceptable for QDS like in Tanzania and Uganda. Beyond that farmer-managed seed sales should be considered outside their geographical growing areas.

Indigenous Traditional Knowledge, IPR and Farmer Rights in Kenya

Protection of Intellectual Property is enshrined in Article 40⁵ of the Constitution of Kenya 2010 which places the mandate on the government to protect and enforce Kenyan's Intellectual Property Rights.

Protecting ITK related to Kenya's indigenous and genetic heritage is a mandate vested under the National Museums and Heritage Act [Cap 216] and amended in 2016. Kenya as a member state of WIPO since 1971, has in place four intellectual property protection bodies:

- 1] The Kenya Industrial Property Institute [KIPI]
- 2] The Kenya Copyright Board [KECOBO]
- 3] Kenya Plant Health Inspectorate Services [KEPHIS]
- 4] The Anti-Counterfeit Agency [ACA]

Defining Intellectual Property rights regarding the knowledge and practices of farmers can be a complex task, particularly regarding how they maintain, select, and improve their genetic material to achieve better crop performance and acceptance, season after season, under varying climatic conditions.

This concept led to the establishment of the International Treaty on Plant Genetic Resources for Food and Agriculture [IPTGRFA], which aims to protect the valuable

knowledge and expertise held by farmers. This knowledge is considered to be worthy of protection under farmers' seed rights.

Tanzania Seed Sector Frameworks

Tanzania's seed sector operates under a multifaceted framework encompassing various policies, regulations, and initiatives aimed at promoting its development and effectiveness.

1. National Seed Policy and Regulatory Framework:

- **Seeds Act 2003:** The Seeds Act 2003 remains the latest act governing the seed sector in Tanzania. While there have been amendments and regulations released since its enactment, the core legislation has not been replaced. This primary legislation establishes the legal framework for seed production, marketing, and certification in Tanzania. It covers aspects like seed varieties, quality standards, certification procedures, and trade regulations. The Seeds [Amendment] Act, 2014 [Act No. 4 of 2014 introduced additional provisions to the Act, such as regulating seed traders and seed inspectors.
- These changes, along with the proposed harmonized Act in Zanzibar, made Tanzania a member of the UPOV91 Convention in 2015 before Kenya. These changes, along with the proposed harmonized Act in Zanzibar, made Tanzania a member of the UPOV91 Convention in 2015 before Kenya.
- **Seed Regulations 2006:** These regulations provide detailed guidelines for implementing the Seeds Act, including specific requirements for seed testing, labelling, and inspection.
- **Plant Variety Protection Act 2002:** This law safeguards the intellectual property rights of plant breeders, promoting innovation and development of new seed varieties.

2. Regional and International Harmonization:

- **Southern African Development Community [SADC] Seed Harmonization Initiative:** Tanzania participates in this initiative to harmonize seed regulations across SADC member states, facilitating regional seed trade and improving market access.

- International Seed Federation [ISF] Seed Trade Rules: While not formally adopted, these rules are often used as a reference point for international seed trade contracts in Tanzania, promoting transparency and fair-trade practices.

3. Institutional Framework:

- Ministry of Agriculture [MoA]: The MoA, through its Seeds Unit, oversees the implementation of the seed sector framework, including policy development, regulatory enforcement, and promoting research and development.
- Tanzania Seed Trade Association [TASTA]: This private sector association represents seed companies and stakeholders, lobbying and advocating for their interests and promoting best practices in the seed sector.
- Other institutions: Research institutions, universities, and NGOs also play a role in supporting the development of the seed sector through research, capacity building, and extension services.

Farmer-Managed Seed Systems [FMSS]: While not directly addressed in the national framework, FMSS are recognized as a crucial component of Tanzania's seed system, especially for small-scale farmers. Efforts are underway to integrate FMSS into the broader seed sector framework.

Tanzania benefits from FAO's technical assistance in strengthening its seed systems. The Seeds Act No. 18 [2003] and a 2013 amendment that is under revision focus on commercial farmers, but have created space for smallholder farmers to produce and market quality declared seed. The Act is otherwise silent on farmers' rights to use, exchange, and sell farm-saved seed

Uganda Seed Sector Frameworks

Farmer-managed seed Systems [FMSS] while not directly addressed in the national framework, are recognized as a crucial component of Uganda's seed system, especially for small-scale farmers. Uganda has a robust QDS system supportive of indigenous seed and smallholder farmers. Efforts are underway to integrate FMSS into the broader seed sector framework.

1. Legislative Framework:

- Plant Variety Protection Act 2006: This law protects the intellectual property rights of plant breeders, promoting investment in new seed varieties.
- Seeds and Plant Breeders Act 2006: This act establishes the legal framework for seed production, marketing, and certification in Uganda. It covers aspects like seed quality standards, certification procedures, and trade regulations.
- The most recent Intellectual Property protection legislation in Uganda is the Plant Variety Protection Act [2014].

2. National Policies and Strategies:

- National Seed Policy 2014-2019: This policy outlines the long-term vision and strategic objectives for developing the Ugandan seed sector. It focuses on increasing access to affordable, high-quality seeds, enhancing research and development, and improving market efficiency.
- Uganda National Seed Strategy 2014/15-2019/20: This strategy provides a detailed operational plan for implementing the National Seed Policy. It identifies specific interventions and programs to achieve the policy goals.

3. Institutional Framework:

- Ministry of Agriculture, Animal Industry and Fisheries [MAAIF]: The MAAIF, through its Directorate of Crop Production and Marketing, oversees the implementation of the seed sector framework.
- Uganda Seeds Company Limited [USCL]: This government-owned company plays a key role in seed production, processing, and marketing, particularly for major crops like maize and beans.
- Uganda National Agricultural Research Organization [NARO] conducts research and develops new seed varieties adapted to local conditions.
- Other institutions: Private seed companies, NGOs, and farmer organizations also contribute to the seed sector development.

4. Regional and International Harmonization:

- East African Community [EAC] Seed Harmonization Initiative: Uganda participates in this initiative to align its seed regulations with other EAC member states, facilitating regional seed trade.

- International Seed Federation [ISF] Seed Trade Rules: While not formally adopted, these rules are often used as a reference point for international seed trade contracts in Uganda, promoting transparency and fair-trade practices.

Uganda participates in the FAO SEED programs, which supports the development of national seed systems.

CHAPTER SEVEN

Stakeholder Analysis:

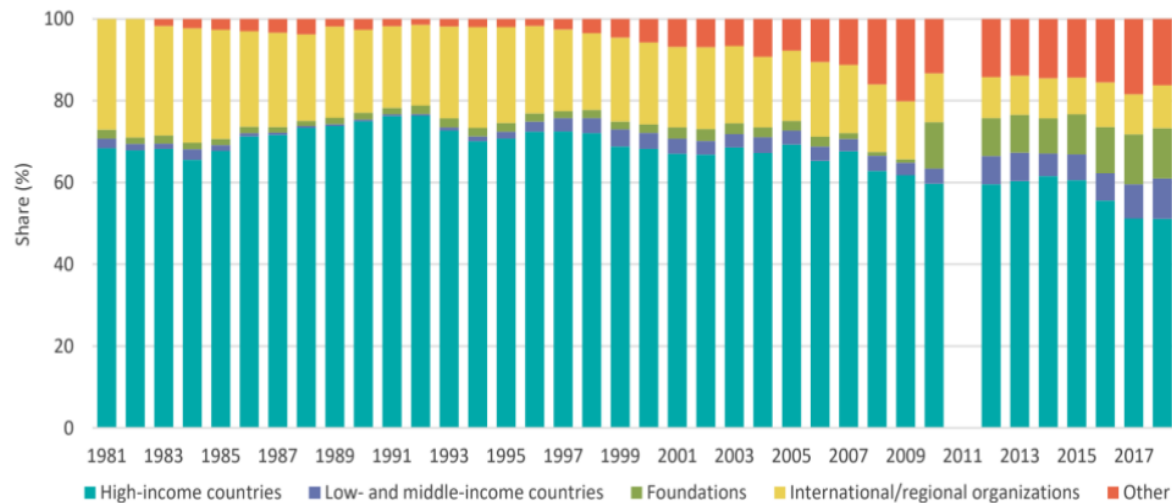
To understand the stakeholders involved in the East African Seed sector, a desktop review that employed various methods was used. Documented reports, articles, and even social media were analyzed to identify potential stakeholders and their concerns. Existing databases and targeted online surveys provided further insights. Interviews with experts and community leaders offered a deeper understanding of stakeholder perspectives and power dynamics. Additionally, publicly available information was used to map stakeholder networks and identify key influencers. While complex modelling was avoided due to resource limitations, the chosen methodologies were carefully selected and adapted to effectively analyze stakeholders despite limited field access, resulting in a valuable overview of the Seed sector landscape in East Africa.

Stakeholders are individuals, groups, or organizations directly or indirectly affected by or influencing the sector policies, systems, and practices surrounding Seed production, marketing, and utilization. They play diverse roles and have vested interests in the successful functioning of the seed sector. Each stakeholder has specific interests, concerns, and needs related to the seed sector. These can range from economic gains [farmers, seed companies] to food security [consumers, NGOs] to environmental conservation [researchers, environmental groups]. Stakeholders can influence the seed sector framework through various means, such as CSOs in advocacy, governments' influence on participation in policy and decision-making processes, the donor community, and philanthro-capitalists such as the Bill Gates Foundation use of their immense economic power, and knowledge-sharing as tightly controlled by academia and the CGIAR system.

Stakeholders are interconnected and interdependent. The actions of one stakeholder can impact the well-being of others within the same system. This is seen in the power relations around the CGIAR, [formally known as the Consultative Group on International Agricultural Research] - a network of 15 international agricultural research centres, including the International Institute of Tropical Agriculture [IITA] and the International Maize and Wheat Improvement Center [CIMMYT]. Over the years the donor mix of funders to the CGIAR system has changed dramatically. Since 2010 foundations and

private donors –referenced to as others in Figure 10⁴⁸– have increased their financial support and therefore influence.

Figure 10. Total CGIAR funding by donor groups, 1981–2018



Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Note: 2012–2018 data were estimated using center-directed (Window 3) and bilateral funding by donor, combined with estimates of national contributions to the CGIAR Fund based on their shares of systemwide and programmatic funding (Windows 1 and 2).

The CGIAR centers play a crucial role in the seed sector frameworks, as they research and develop improved seed varieties that serve as the foundation for national breeding programs and seed systems. They provide guidelines, decision-making tools, and technical practices to national and commercial stakeholders involved in the seed sector, and offer training programs for national researchers, seed producers, and other stakeholders to develop and manage commercial seed systems⁴⁹.

The CGIAR system supports national breeding programs in accessing and sharing germplasm resources, training scientists, and facilitating technology transfer. Their greatest influence is through advocating for policies that promote seed systems, such as intellectual property rights frameworks that facilitate access and control to commercial seed varieties and regulations that ensure seed quality. They participate in and lead global agreements and debates related to seed sector development, shaping international, regional, and national frameworks and guiding principles.

⁴⁸ Beintema, N. M. [2020]. Evolution of CGIAR funding. Intl Food Policy Res Inst.

⁴⁹ Stone, G. D. [2022]. Surveillance agriculture and peasant autonomy. *Journal of Agrarian Change*, 22[3], 608-631.

The emergence of the BMGF as the foremost donor to the CGIAR system raises serious concerns for FMSS and seed sovereignty in East African nations. Bill Gates wields unparalleled influence in global Seed Systems, presenting a significant and questionable force in this critical domain.

Other Stakeholders include individuals Farmers or groups engaged in agricultural production that rely on access to quality, affordable seeds for their livelihoods and food security.

Private seed businesses and public institutions are involved in commercial seed production, processing, marketing, and distribution. Their interests lie in market access, profitability, and innovation.

The national and regional governments are important stakeholders responsible for policy formulation and implementation.

The universities, research centres, and scientists contribute to seed sector development through research on breeding new varieties, testing seed quality, and developing best practices.

As stakeholders, non-governmental organizations [NGOs] working on issues like farmer rights, biodiversity conservation, and food security advocate for policies that ensure equitable access to seeds and sustainable seed systems.

Organizations representing consumers' interests in terms of food safety, affordability, and access to diverse seed varieties.

Indigenous communities: Traditional communities with extensive knowledge about local seed varieties and seed management practices. Their participation is crucial for preserving biodiversity and promoting sustainable seed systems.

Financial institutions: Banks and other financial providers supporting the seed sector through loans, investments, and risk management mechanisms.

The influence over the global Seed Sector Regulatory Framework is a complex landscape with various players wielding influence at different levels and through different mechanisms.

Bill & Melinda Gates Foundation's Role in Seed Sector Development: Funding and Influence

The Bill & Melinda Gates Foundation has been a major player in shaping seed sector development, particularly in Sub-Saharan Africa, through significant funding and strategic partnerships. Their initiatives include

Funding:

- \$306 million commitment in 2008: This package included a \$164.5 million grant to AGRA [Alliance for a Green Revolution in Africa] to establish a Soil Health Program alongside their existing Seeds Program, aiming to boost yields and incomes for smallholder farmers⁵⁰.
- \$56 million grant to AGRA in 2012: This funding supported AGRA's Program for Africa's Seed Systems [PASS], which successfully increased access to disease-resistant and higher-yielding seeds for key food crops⁵¹.
- Access to Seeds Index: The foundation also funded the Access to Seeds Index, which assesses seed systems in various countries and influences seed companies to improve the availability and quality of seeds for smallholder farmers⁵².

Influence:

- Promoting private-sector investment: The foundation encourages private companies to invest in seed research and development, aiming to create sustainable and profit-driven solutions for improving seed systems⁵³.
- Policy advocacy: The foundation works with governments to strengthen seed regulations and policies, ensuring access to quality seeds for farmers⁵⁴.
- Supporting research and innovation: The foundation funds research on new seed varieties, breeding techniques, and seed storage technologies to address specific challenges faced by smallholder farmers⁵⁵.

The foundation's influence isn't without criticism. Their focus on high-yielding commercial seeds disregards traditional varieties and farmer-driven seed systems.

⁵⁰ Gates Foundation Press Release, 2008.

⁵¹ Gates Foundation Press Release, 2012

⁵² Gates Foundation Grant Database, 2016

⁵³ Gates Foundation website, Agricultural Development Programs

⁵⁴ Gates Foundation website, Agricultural Development Program

⁵⁵ Gates Foundation website, Agricultural Development Programs

Additionally, concerns exist about potential corporate control over seeds and dependence on external inputs⁵⁶.

Overall, the Bill & Melinda Gates Foundation has played a significant role in transforming the seed sector, particularly in Africa. Their funding and strategic partnerships have boosted access to improved seeds, increased yields, and contributed to improved livelihoods for smallholder farmers. However, it's crucial to engage in ongoing dialogues and research to ensure equitable and sustainable seed sector development.

1. Intergovernmental Organizations:

- Food and Agriculture Organization [FAO]: Plays a critical role in facilitating international cooperation and providing technical assistance on seed systems. It promotes best practices, develops international standards [Codex Alimentarius], and supports the implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA].
- World Trade Organization [WTO]: Sets the rules for global trade, including agricultural products like seeds. The Agreement on Agriculture [AoA] outlines provisions related to seed trade, impacting national regulatory frameworks.
- WIPO-UPOV: International Union for the Protection of New Varieties of Plants [UPOV]: Offers a system for plant variety protection, promoting innovation and seed trade by granting breeders intellectual property rights.
- The USA's accession to UN treaties and other like-minded countries

Norway:

Norway is consistently among the top financial contributors to the ITPGRFA's Multilateral System of Access and Benefit-sharing [MLS], demonstrating a commitment to supporting the Treaty's resource mobilization efforts⁵⁷. Norway actively participates in ITPGRFA Governing Body meetings and promotes the Treaty's objectives within international forums like the Food and Agriculture Organization [FAO]. Likewise, Norway supports research initiatives related to plant genetic resources, such as the Global Seed

⁵⁶ ETC Group and African Centre for Biodiversity, 2014

⁵⁷ <https://www.fao.org/documents/card/en?details=3525f00a-0c3c-4774-a6ea-2cbbfa591cce/>

Vault in Svalbard, contributing to the Treaty's goal⁵⁸ of conservation and sustainable utilization.

India:

India has developed a comprehensive national policy and legal framework⁵⁹ for implementing the ITPGRFA, including establishing a National Gene Bank and a National Focal Point to coordinate activities. India actively engages farmers in the conservation and management of plant genetic resources through Farmer-Managed Seed Systems and community seed banks, aligning with the Treaty's emphasis on farmer rights. Additionally, India actively participates in ITPGRFA initiatives like the Global Information System on Plant Genetic Resources for Food and Agriculture [WIEWS] and contributes expertise to international research and development projects⁶⁰.

Other countries notable stakeholders are Brazil and the Philippines. Brazil is a global leader in biodiversity conservation⁶¹ and actively participates in ITPGRFA initiatives related to in-situ conservation and sustainable utilization of plant genetic resources. Brazil has established a national system for sharing benefits arising from the utilization of genetic resources, aligning with the ITPGRFA's core principles. The Philippines actively promotes farmer-led seed systems⁶² and community-based conservation initiatives, emphasizing the ITPGRFA's focus on farmer rights and participation.

2. Regional Organizations:

- African Union [AU]: Supports the development of a harmonized seed regulatory framework for Africa and promotes regional seed trade through initiatives like the Seed Harmonization Initiative.
- International Seed Federation [ISF]: Represents the global seed industry, collaborating with governments and intergovernmental organizations to influence policy and regulatory frameworks.

⁵⁸ <https://www.fao.org/plant-treaty/meetings/en/>

⁵⁹ <http://nbaindia.org/>

⁶⁰ <https://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa-old/gssystem/en/>

⁶¹ <https://www.embrapa.br/busca-de-publicacoes/-/publicacao/1117003/recursos-geneticos-vegetais>

⁶² <https://searn-network.org/>

- AGRA [formerly Alliance for a Green Revolution in Africa] is an important stakeholder through its heavy funding of seed policy and research issues at the regional level. It is also closely followed by AATF

3. Private Sector:

- Multinational Seed Companies: Large seed companies have significant economic clout and influence seed regulations through lobbying and involvement in technical standard-setting processes.
- Smaller Seed Companies participate in shaping national and regional regulations, advocating for their interests in the seed industry.
- The African Seed Trade Association [AFSTA] is the continent-wide lobby group for the seed industry and boosts the African Agricultural Technology Foundation [AATF] and ICRISAT as service providers, most of the Agro-chemical corporations and country associations such as the Tanzania Seed Trade Association [TASTA], The Seed Trade Association of Kenya [STAK]. Interestingly Uganda is not represented.

4. Civil Society Organizations and Non-Governmental Organizations

- Farmer Organizations: Represent the interests of farmers and advocate for access to affordable, high-quality seeds and participatory approaches in policy development.
- Consumer Groups: Raise concerns about issues like genetically modified organisms [GMOs] and seed monopolies, influencing regulations related to biosafety and seed diversity.
- Research Institutions: Provide scientific expertise and evidence-based recommendations that inform regulatory decisions and the development of seed systems.

Seed Sector Stakeholders in Tanzania

The most important Seed Sector Stakeholders in Tanzania include the following the

- 1] Ministry of Agriculture, Tanzania Official Seed Certification Institute [TOSCI],
- 2] Tanzania Seed Trade Association [TASTA],
- 3] Southern Agricultural Growth Corridor of Tanzania [SAGCOT],
- 4] Ruvuma Commercialization and Diversification of Agriculture [RUCODIA],
- 5] Quince Wood Limited, Agricultural Seed Agency [ASA]

Seed Sector Stakeholders in Uganda

Unlike Kenya and Tanzania, the seed stakeholders have no platform association. It also appears that the National government is in the business of the seed sector. The important Seed Sector Stakeholders in Uganda's Seed Sector include the following the

- 1 Ministry of Agriculture, Animal Industry and Fisheries [MAAIF]
- 2 National Agricultural Research Organization [NARO]
- 3 National Seeds Corporation Limited
- 4 Farm Radio International
- 5 ActionAid,
- 6 Seed Systems Development Project [ISSD]
- 7 Uganda National Farmers Union [UNFU]

What are the potential negative impacts of corporate control over seeds and dependence on external inputs in the seed sector? These concerns are answered in other sections of this report.

CHAPTER EIGHT

Towards Inclusive farmer-managed Seed Frameworks

Achieving inclusive farmer-managed Seed sector Frameworks aligned with the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA] requires a multi-pronged approach. This must focus on the following

1. Empowering Farmers-capacity building, Commercial [Industrial] recognition and decision-making:

Farmers should receive training programs and extension services to gain knowledge and skills in seed selection, storage, and quality control. Legal frameworks, certification processes, and community seed banks should recognize and value farmer-managed seed systems. At local, national, and regional levels, farmers must be integrated into policy and decision-making processes related to seed systems.

These empowering infinitives have been successful in Bangladesh. The BRACED Seed Systems and Agricultural Marketing Program empowered farmers through training, community seed banks, and market linkages, resulting in increased income and food security.

2. Access and Benefit Sharing:

It is important to provide fair access to a variety of genetic resources and establish systems that acknowledge the contributions of farmers in conserving and improving seed quality. This can be achieved through mechanisms such as royalty payments or community development projects that compensate farmers for the use of their seed varieties. It is also important to strengthen local seed markets that allow farmers to exchange and sell their seed varieties, which helps to promote diversity and resilience.

The Andean Seed Network in Peru uses a community-based benefit-sharing model where royalties from traditional varieties' commercialization are reinvested in research and community development projects.

3. Knowledge and Information Sharing:

It is important to recognize and value the knowledge and practices of indigenous communities regarding seed management. By incorporating these practices into formal research and extension systems, we can achieve better outcomes. One way to do this is to engage farmers in participatory research and breeding programs, which can help

develop seed varieties that are well-suited to local conditions and meet the needs of farmers. Additionally, creating open-source platforms that provide information on seed varieties, best practices, and market opportunities can be beneficial for all farmers. These platforms should be easily accessible to all farmers to foster greater collaboration and knowledge sharing.

The "Seed Savers Network" program in Kenya involves farmers in the conservation and utilization of local seed varieties by documenting and sharing traditional knowledge.

4. Supportive Governance and Policies:

It is important to create national policies and legal frameworks that acknowledge and promote farmer-managed seed systems. This includes provisions for community seed banks and local seed markets. Sufficient financial resources should be allocated to support capacity building, research, and infrastructure development for these systems. Additionally, it is crucial to ensure gender equality in access to resources, training, and decision-making roles within the seed sector.

The Philippine Seed Law recognizes and supports farmer-managed seed systems, encouraging local seed production and community seed banks⁶³.

5. Partnerships and Collaboration:

Establishing robust partnerships between government agencies and farmer organizations is crucial to ensuring policies and programs are implemented effectively. Collaborating with NGOs and research institutions can help build capacity, conduct research, and advocate for farmer-managed seed systems. It is also essential to facilitate the exchange of knowledge and experiences between countries that have successful farmer-managed seed systems.

The International Maize and Wheat Improvement Center [CIMMYT] collaborates with farmer organizations in several countries to develop locally adapted maize and wheat varieties through participatory breeding programs⁶⁴.

Meeting the needs of the ITPGRFA:

⁶³ Fernandez, P. G., & Zamora, O. B. [1995]. Farmer-based variety development, maintenance and multiplication in the Philippines. *Integrating Seed Systems for Annual Food Crops*, 285.

⁶⁴ Ceccarelli, S., & Grando, S. [2020]. Participatory plant breeding: Who did it, who does it and where? *Experimental Agriculture*, 56[1], 1-11.

Farmer-managed seed sector frameworks can contribute to the objectives of the ITPGRFA by addressing these elements.:

- Conserving and sustainably utilizing plant genetic resources for food and agriculture: Farmer-managed systems often maintain diverse seed varieties adapted to local conditions, contributing to biodiversity conservation.
- Promoting farmer rights: Recognizing and upholding farmers' rights to save, exchange, and utilize seeds within the framework promotes their ownership and control over genetic resources.
- Promoting equitable benefit-sharing: Ensuring fair compensation for farmers who contribute to the development and utilization of seed varieties fosters equitable benefit-sharing within the seed sector.

To achieve inclusive farmer-managed seed sector frameworks, a dedicated effort is required from governments, researchers, NGOs, and most importantly, farmers themselves. By working together, we can create a seed sector that empowers farmers, contributes to food security and resilience, and upholds the values of the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA].

Current Policy Gaps

To achieve inclusive farmer-managed Seed Frameworks that meet the needs of the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA], the following are required:

- 1] **Strong farmers' organizations:** Farmer-managed Seed Frameworks [FMSFs] are most successful when they are led and managed by farmers themselves. This requires strong farmers' organizations that can represent the interests of their members and advocate for their rights.
- 2] **Supportive government policies:** Governments need to create supportive policies for FMSFs. This includes policies that recognize and protect farmers' rights to seeds, and that provide financial and technical support to FMSFs.
- 3] **Capacity building:** Farmers and other stakeholders need to have the capacity to manage FMSFs effectively. This includes training on seed production, selection, storage, and distribution, as well as training on business management and marketing.

- 40 **Access to resources:** FMSFs need access to resources such as land, water, and credit. They also need access to information about new technologies and best practices.

FMSFs can play an important role in ensuring that farmers have access to the seeds they need to produce food and adapt to climate change. There is a great need to

- 10 Map out existing seed systems: The first step is to map out existing seed systems and identify the needs of farmers and other stakeholders. This will help to identify the gaps that need to be filled and the opportunities for FMSFs.
- 20 Develop a national FMSF strategy: Once the needs have been identified, a national FMSF strategy should be developed. This strategy should be developed in consultation with farmers, other stakeholders, and the government.
- 30 Establish a national FMSF coordination mechanism: A national FMSF coordination mechanism is needed to support the implementation of the national FMSF strategy. This mechanism should be inclusive of all stakeholders, including farmers, government agencies, NGOs, and the private sector.
- 40 Provide financial and technical support to FMSFs: Governments and other donors should provide financial and technical support to FMSFs. This support can be used to build capacity, develop infrastructure, and access resources.
- 50 Promote the exchange of information and best practices: There is a need to promote the exchange of information and best practices among FMSFs. This can be done through workshops, training programs, and farmer-to-farmer exchanges.

What are the policy gaps in Protecting farmer-managed Seed Systems and their rights to seed and biodiversity?

In the three East African countries, there are several policy gaps in protecting farmer-managed seed systems and their rights to seed and biodiversity. There are also several challenges in implementing effective policies to support farmer-managed seed systems.

- 10 Lack of recognition of farmer-managed seed systems in national seed policies and laws. In the three East African countries, seed policies and laws have increasingly continued to focus primarily on the Commercial “Industrial” seed sector, with little or no mention of farmer-managed seed systems. This has led to

legal and regulatory challenges for farmers who are trying to produce and exchange seeds outside of the Commercial “Industrial” system⁶⁵.

- 20 Restrictive intellectual property laws. Plant variety protection “PVP” laws can restrict farmers' rights to save, use, exchange, and sell seeds of protected varieties. This is particularly problematic in the East African countries where farmers rely on saved seeds for a significant portion of their planting material.
- 30 Limited access to public sector germplasm. Farmers often have difficulty accessing public sector germplasm, which is the foundation of all plant breeding. This can be due to several factors, such as restrictive licensing agreements or lack of funding for germplasm banks.
- 40 Weak enforcement of farmers' rights. Even when countries have laws that recognise farmers' rights to seed and biodiversity, these laws are often not well enforced. This can leave farmers vulnerable to exploitation by the Commercial “Industrial” seed sector and other powerful actors.
- 50 Lack of awareness and understanding of farmer-managed seed systems among policymakers and government officials. This can lead to policies that are not supportive of farmer-managed seed systems, or that even undermine them.
- 60 Limited capacity to implement policies that support farmer-managed seed systems. All three governments do not have the resources or expertise to implement effective policies to support farmer-managed seed systems.
- 70 Resistance from the Commercial “Industrial” seed sector. The commercial seed sector often has a vested interest in maintaining the status quo, which means that they resist policies that support farmer-managed seed systems. For example, in Kenya, the Seed Traders Association -STAK prides itself as an “association of seed companies registered by the Kenya Plant Health Inspectorate Service “KEPHIS” to produce, process and/or market seed in Kenya as well as organizations who play other supportive roles to agriculture.” The implication is that any Farmer organization not registered in STAK does not get the benefit of being close to the regulator and if they produce, process or market seeds, it is illegal or else they must declare they are selling “grain” -not Seed.

⁶⁵ Kahaso Dena H “2023” Greenpeace Kenya Article

<https://www.greenpeace.org/africa/en/press/52305/farmers-file-a-court-case-to-stop-punitive-seed-laws/> Accessed Saturday, November 4, 2023

Despite these challenges, there are several things that governments can do to close the policy gaps and support farmer-managed seed systems. These include:

- 1▯ Review and revise national seed policies and laws to ensure that they recognize and support farmer-managed seed systems.
- 2▯ Reform intellectual property laws to ensure that they do not unduly restrict farmers' rights to seed and biodiversity.
- 3▯ Improve access to public sector germplasm for farmers.
- 4▯ Strengthen enforcement of farmers' rights.
- 5▯ Increase investment in research and development on farmer-managed seed systems.
- 6▯ Raise awareness and understanding of farmer-managed seed systems among policymakers and government officials.
- 7▯ Build capacity to implement policies that support farmer-managed seed systems.
- 8▯ Work with the Commercial ▯Industrial▯ seed sector to develop mutually beneficial partnerships.

The East African governments can contribute to the protection of farmer-managed seed systems and their rights to seed and biodiversity by implementing these measures. This will aid in the establishment of food systems that are more resilient and sustainable, considering Agroecology and organic farming practices.

Food Sovereignty and FMSS in Kenya

The Food and Agriculture Organization of the United Nations ▯FAO▯ estimates that Kenya's food import bill has been on a steady upward trend over the past 30 years. In 1993, the country spent US\$330 million on food imports. By 2022, this figure had risen to a staggering US\$9.3 billion. This increase is due in part to several factors, including a growing population, rising incomes, and urbanization.

In order of value, the top five food imports in Kenya in 2022 were wheat, rice, maize, sugar, and vegetable oils. These imports are essential for meeting the country's food needs, but they also place a strain on the economy. The changing dietary patterns and lifestyles away from traditional food crops which form the larger basis of the FMSS, reflect a changing reliance on the crop seeds that would support Food sovereignty.

Kenya's current urbanization rate is 35.1%, which means that over a third of the population lives in urban areas. This rate is expected to increase to 50% by 2050^{66, 67}. The increasing reliance on imported wheat and rice will put further pressure on the country's maize production, which has been unable to keep up. Maize will need to be imported. This scenario points to Kenya being the most vulnerable in food security. The contribution of farmer seeds and agroecology has an uphill task to provide a measure of food sovereignty, especially to rural populations in Kenya.

However, Kenya's rising middle-income class and sensitivity to maintaining sustainable diets including organic, gives hope for agroecological farmers. Agroecology has a heavy reliance on using Farmer-managed seeds. It is believable that a growing population in Kenya will drive the demand for traditional foods and therefore the need for FMSS.

Food Sovereignty and FMSS in Uganda and Tanzania

Uganda's current urbanization rate is 21.3%, which means that over one-fifth of the population lives in urban areas. The rural living of some 40 million people creates a heavy reliance on agricultural structures and traditional farmer-managed seed systems prevail.

This rate is expected to increase to 35% by 2050. Uganda has made significant progress towards achieving food self-sufficiency in recent years. The Uganda Bureau of Statistics [UBOS] estimates that Uganda is now a net exporter of food, and the proportion of the population that is food insecure has declined from 43% in 2002 to 24% in 2022⁶⁸.

The Seed policy frameworks in Tanzania are most supportive of industrial agriculture compared to those in Kenya and Uganda. The government has had a significant role in promoting the agricultural corridors on a model of public-private partnerships. Government agencies have been rather silent on the use of traditional seeds, supporting agroecological farming practices, rather than restricting them.

⁶⁶ Ács, Z. J., Szerb, L., & Autio, E. [2016]. Global entrepreneurship and development index 2015. London: Springer International Publishing.

⁶⁷ Bren d'Amour, C., Reitsma, F., Baiocchi, G., Barthel, S., Güneralp, B., Erb, K. H., ... & Seto, K. C. [2017]. Future urban land expansion and implications for global croplands. *Proceedings of the National Academy of Sciences*, 114[34], 8939-8944.

⁶⁸ Nabuuma, D.; Ekesa, B.; Faber, M.; Mbhenyane, X. [2021] Food security and food sources linked to dietary diversity in rural smallholder farming households in Central Uganda. *AIMS Agriculture and Food* 6[2] p. 644-662.

CHAPTER NINE

Conclusions and Recommendations

The current seed legislation in Tanzania [Seeds Act of 2003 and its amendment of 2014] is largely silent on the issue of smallholder farmers⁶⁹. Senior government officials claim that the new legislation is aimed at the ‘commercial’ farming sector, and will not impact smallholder farmers. The focus is on the commercialization of agriculture, and the provision of a conducive policy environment for foreign direct investment in seed breeding and distribution. The threats to smallholder farmers are wide-ranging; in the short-term including exclusion from access to the benefits of improved seeds, in the longer term the gradual weakening of the rights of small farmers to operate their traditional practices of seed sharing and exchange, and their increased dependence on external inputs

Recommendations for supporting FMSS

FMSS are a vital part of East African agriculture. By supporting FMSS⁷⁰, we can help to ensure food security, conserve agrobiodiversity, and empower farmers

- 1] **Documenting traditional knowledge:** Traditional knowledge about seeds should be documented and preserved so that it can be passed on to future generations.
- 2] **Promoting the use of traditional seeds:** Policies and programs should be developed to promote the use of traditional seeds.
- 3] **Supporting community-based seed banks:** Community-based seed banks should be supported to help them to collect, store, and distribute seeds.
- 4] **Raising awareness of the importance of FMSS:** Awareness of the importance of FMSS should be raised among policymakers, development agencies, and the general public.

In East African countries, the plant breeders’ rights exception under the Plant Breeder’s Rights Act, is implemented in different ways. In most countries, farmers can sell produce from saved seeds, but in Kenya, it is not allowed. The Seeds and Plant Varieties [Plant

⁶⁹ Farmer Managed Seed System in Tanzania [2015] - their operation, benefits, successes, challenges & support. Tanzania Organic Agricultural Movement [TOAM].

⁷⁰ Vernooy, R. [2017]. Options for national governments to support smallholder farmer seed systems: The cases of Kenya, Tanzania, and Uganda.

Breeder's Rights Draft Regulations, 2021, limits farmers to commercializing crops produced with farm-saved seed. This review concludes that there is an unfavourable legal environment for the informal seed system in Kenya.

More reforms that fully recognise and provide for the extensive role of the farmer seed systems in East African countries are needed. There is a need to ensure more support for the FMSS through collaborative research and funding usually accorded to the Commercial Industrial seed system⁷¹.

Democratizing the Input Subsidy Programs (ISP):

Agricultural Input Subsidy Programs (ISPs) in agriculture in East Africa, are government initiatives aimed at providing aid, support, or financial assistance to farmers for the purchase of industrial agricultural inputs such as seeds, fertilizers, pesticides, and other necessary materials. These programs are designed to improve agricultural productivity, increase food security, alleviate poverty among smallholder farmers, and promote overall economic development in the agricultural sector. ISPs are typically targeted towards smallholder farmers who may not have the financial resources to purchase inputs at market prices.

Subsidy programs have long been used to produce and distribute commercial/ industrial cultivars and seeds to farmers in many African countries. Farmer-targeted subsidies include an array of schemes, from free seed packs, to discount vouchers redeemable at an agrochemical dealer's shop, to rebates on the purchase of large seed consignments, to free seed distribution through social protection programs and emergency relief. Similarly, subsidies targeted to seed producers include special concessions on credit, transport, warehousing, land leasing, and equipment imports. All are popular ways of encouraging the acceleration of output and yield growth in agriculture, but not all are necessarily appropriate for building a vibrant and sustainable seed system and market⁷².

Input Subsidy Programs encounter various challenges and criticisms. These include concerns regarding their high costs and financial sustainability, which have strained

⁷¹ Kotecha, P., Walwyn, D., & Pinto, C. (2011). Deepening research capacity and collaboration across universities in SADC: A Southern African Universities Regional Research and Development Fund. Southern African Regional Universities Association (SARU).

⁷² Chirwa, E., & Dorward, A. (2013). *Agricultural input subsidies: The recent Malawi experience* (p. 320). Oxford university press.

government budgets. There is also the risk of market distortions, potentially affecting private sector input suppliers negatively. Moreover, there are concerns about corruption, mismanagement, and the leakage of subsidized inputs, undermining the effectiveness of these programs. Environmental impacts, particularly the overreliance on chemical fertilizers and pesticides, pose additional challenges. Furthermore, there are issues related to the limited targeting and inclusivity of these programs, with certain farmers benefiting disproportionately compared to others. Notably, the most significant criticism of Input Subsidy Programs lies in their discrimination against Agroecology, smallholder farming and their traditional food and seed systems.

The three East African countries have supported Input subsidy programs, mainly to support commercial agriculture production resulting in increased uptake for Hybrid Seeds, chemical fertilizers, and pesticides. There are no recorded events on ISP benefiting agroecological farming from any of the three national governments in East Africa.

These government programs, through which farmers receive fertilizer –and in some cases seed– at below-market prices, were largely phased out during the 1990s because the emerging consensus was that they only weakly contributed to agricultural productivity growth, food security, and poverty reduction goals, imposed unsustainable burdens on national treasuries, and hindered the development of private input distribution systems.

ISPs in Kenya

The Kenyan government has been implementing the National Agricultural Inputs Subsidy Program –NAISP– since 2008. The program provides subsidies for fertilizers, seeds, and other agricultural inputs to smallholder farmers. The program has been successful in increasing agricultural productivity, but it has also been criticized for its high cost and for its potential to distort the market for agricultural inputs.

There have been concerns raised about the ISP's potential for corruption and mismanagement, which could lead to inefficiencies and reduced benefits for farmers. It is also important to note that ISPs can create an overreliance on chemical fertilizers, which, if not accompanied by proper soil management practices, can have negative long-term consequences for soil health and fertility. The program in question requires a significant amount of government funding, which raises concerns about its fiscal sustainability in the long run. Some people argue that it would be more beneficial to

direct resources towards other agricultural development initiatives such as improving infrastructure or providing better access to research and technology.

There is a concern that when subsidies are only targeted towards specific inputs or crops, some farmers benefit more than others, which could potentially worsen existing inequalities within the agricultural sector. Certainly, Agroecological farming operations that use FMSS are yet to come under the radar for subsidy support.

ISPs in Tanzania

The Tanzanian government has been implementing the Agricultural Sector Development Program [ASDP] since 2009 and the National Agricultural Input

Voucher Scheme [NAIVS] [2008]. These programs provided subsidies for fertilizers, seeds, and other agricultural inputs to smallholder farmers. The program has been successful in increasing agricultural productivity, but it has also been criticized for its high cost and for its potential to distort the market for agricultural inputs.

The level of funds leached through ISPs is astounding. About 60% of subsidized fertilizer is diverted [pilfered] by government officials or leaked by beneficiaries onto secondary markets in Tanzania.

No support subsidies have been recorded as directed towards FMSS or Agroecological programs.

ISPs in Uganda

The Ugandan government has been implementing the Agricultural Input Voucher System [AIVS] since 2008. The program provides vouchers to smallholder farmers that can be redeemed for fertilizers, seeds, and other agricultural inputs. The program has been successful in increasing agricultural productivity, but it has also been criticized for its high cost and for its potential to distort the market for agricultural inputs.

Overall, input subsidy programs in East Africa have been successful in increasing agricultural productivity for commercial industrial operations even in smallholder farmers' fields. They have also been criticized for their high cost, and for their potential to distort the market for agricultural inputs, and their lack of attention to agroecological farming.

There have been reports of low-yield responses to Hybrids and fertilizer provided through ISPs. This puts doubts on the quality of the Certified seeds provided. Perhaps

healthy robust seeds from the local Community Seed Banks would have performed better in the local area.

The effectiveness of input subsidy programs can vary depending on the specific design of the program and the context in which it is implemented. ISPs are typically funded and implemented by national governments usually through publicly collected revenues. They may also involve collaboration with international development organizations and or donor agencies. The latter source skews the use of resources towards purchasing costly commercial seeds and industrial fertilizers and pesticides. Given the need to shore up food production in the countries of East Africa, it is high time that ISP included Agroecology and FMSS in the demand for ISP.

CHAPTER TEN

The way forward and Call to action

Challenges abound within Farmer-Managed Seed Systems, presenting hurdles that hinder their growth and effectiveness. Firstly, there exists notable policy neglect at the national level, where seed policies predominantly cater to the Commercial “Industrial” sector, sidelining the needs and nuances of farmer-managed systems “FMSS”. This disregard translates into legal and regulatory barriers for farmers, curtailing their access to essential resources such as funding, research opportunities, and knowledge exchange platforms.

Moreover, the landscape is further complicated by intellectual property barriers. Stringent plant variety protection laws curtail farmers' rights to save, utilize, exchange, and trade seeds, a particularly pressing issue for those reliant on saved seeds for their agricultural practices. Compounding this, the weak enforcement of farmers' rights leaves them vulnerable to exploitation by various actors.

Access to germplasm, crucial for breeding, is also limited for farmers within FMSS. Often, they face obstacles in accessing public sector germplasm due to restrictive licensing agreements or inadequate funding for germplasm banks.

Even with supportive policies in place, the implementation of these measures encounters its own set of challenges. These include an awareness gap among policymakers, who may lack understanding of the intricacies of FMSS, thereby crafting policies that inadvertently undermine them. Additionally, governments often grapple with limited capacity, lacking the requisite resources and expertise to effectively support FMSS. Furthermore, resistance from the Commercial “Industrial” seed sector poses another impediment, as they may oppose policies that seek to empower FMSS, safeguarding their own vested interests.

In essence, addressing these multifaceted challenges is paramount to fostering an environment where farmer-managed seed systems can thrive, ensuring agricultural resilience and sustainability in the long run.

Call to action: Solutions for Supporting FMSS

1. Policy Neglect: National seed policies primarily focus on the Commercial “Industrial” sector, ignoring farmer-managed systems “FMSS”. This lack of recognition creates legal and regulatory hurdles for farmers and limits their access to funding, research, and knowledge exchange.

Each of the countries in East Africa should review and revise their national seed policies to recognize and support FMSS.

2. Intellectual Property Barriers: Restrictive plant variety protection laws restrict farmers' rights to save, use, exchange, and sell seeds, especially problematic for those reliant on saved seeds. Additionally, weak enforcement of farmers' rights leaves them vulnerable to exploitation.

IP Reform: Ensure intellectual property laws protect farmers' rights and traditional knowledge.

3. Limited Germplasm Access: Farmers often struggle to access public sector germplasm, the foundation for breeding, due to restrictive licensing or lack of funding for germplasm banks.

Improved Germplasm Access: Increase farmer access to public sector germplasm collections.

4. Implementation Challenges: Even with supportive policies, implementation faces hurdles like:

- a. **Awareness Gap:** Policymakers lack understanding of FMSS, leading to policies that undermine them.

CSOS must be able to work in concert with policy drafters in government to create improved policy understanding among enforcers and the law courts.

- b. **Limited Capacity:** Governments often lack the resources and expertise to effectively support FMSS.

The lack of resources to support Farmers' rights is a miscarriage of justice. Special funding mechanisms should be set aside, including from the ABS and the Plant treaty mechanism to support legal reforms and the setting up of necessary infrastructure to support FMSS.

- c) **Industry Resistance:** The Commercial “Industrial” seed sector may resist policies that empower FMSS, protecting their vested interests.

The promulgation of protective laws should be able to dissuade commercial stakeholders from abusing smallholder farming or even using parasitic practices that undermine the rights and sovereignty of the nation to genetic resources and practices.

5). **Strengthening Enforcement of** existing laws protecting farmers' rights calls for constitutional recognition and the enactment of missing policies and legislations that are lacking. In Kenya, the constitution calls for the enactment of an enabling environment for community genetic heritage recognition and protection. The Setting up of FMSS is a beginning and a lot more is required over the years to enable ABS, and market structures for farmers to financially benefit from their own seed.

6). **Investment and Research:** Increase investment in FMSS research and development is required urgently to enable science to be part and parcel of community seed banks and grassroots food systems.

7). **Capacity Building** of farmers and extension workers on FMSS is critical.

8). **All Seed Sector Frameworks need** collaboration and harmonization to

- a) Develop clear definitions and recognition of FMSS.
- b) Promote policy integration and mainstreaming of FMSS support.
- c) Create templates at the Plant treaty and the African Union level for legislative models that are flexible and farmer-friendly so that each East African country can roll out country-specific “sui generis” seed regulations that honour the FMSS.
- d) Provide technical and financial support for local seed security and community seed banks.
- e) Facilitate equitable benefit-sharing mechanisms for farmers.
- f) Promote participatory research and breeding approaches.

9. Mainstreaming Gender into Seed Sector Frameworks:

It is important to ensure that FMSS are truly inclusive and empower both men and women to contribute to and benefit from sustainable seed systems. As CSOs and governments in East Africa implement FMSS it is critical that the following is implemented in each community

- a□ Gender analysis: Conduct context-specific gender analyses to understand existing inequalities and design targeted interventions.
- b□ Capacity building: Provide gender-sensitive training and extension services to empower women with seed management skills and knowledge.
- c□ Inclusive decision-making: Encourage equal participation of women in seed-related decision-making processes at all levels.
- d□ Promote women-led seed initiatives: Support women's seed producer groups and community seed banks, ensuring their access to resources and markets.
- e□ Monitor and evaluate: Regularly monitor and evaluate the impact of interventions to ensure they address gender inequalities effectively.
- f□ Policy and advocacy: Advocate for policies and regulations that promote gender equality in seed systems and address women's specific needs.

Chapter Summaries and Questions

The following section provides abstracts for each chapter in the main document. In addition, almost all the chapters have a section for critical questions meant to facilitate and improve discussions while provoking thought for combined civil society action. These chapter synopses help make this document living and improving so that it will become a reference aid as well as a teaching material for stakeholders in this space of Agroecology.

Chapter 1

Synopsis

Seeds, whether of plant or animal origin, serve as the fundamental components of sustenance and communal life, embodying the promise of nourishment and the assurance of rejuvenation. Across various cultures and traditions, seeds hold profound significance, symbolizing hope, fertility, and the interconnectedness of humanity with the natural world. This paper explores the enduring cultural and spiritual importance of seeds, drawing from ancient texts and religious beliefs spanning civilizations like Mesopotamia, Egypt, Hinduism, and Abrahamic religions. Furthermore, it delves into the contemporary context, highlighting the African Commission's Resolution 372, which emphasizes the protection of Sacred Natural Sites and Territories (SNS&Ts) and the preservation of biodiversity, traditional knowledge, and seed conservation practices within indigenous communities. Resolution 372 recognizes the vital role of seeds in climate resilience and biodiversity conservation, offering a promising framework for safeguarding Africa's natural and cultural heritage for future generations. Through case studies and initiatives like Uganda's collaboration with the African Institute for Culture and Ecology (AFRICE), the paper showcases practical approaches to implementing Resolution 372 and fostering sustainable seed conservation within SNS&Ts. Ultimately, it underscores the interconnectedness of seeds, biodiversity, and cultural heritage, advocating for holistic approaches to address challenges such as biodiversity loss and climate change.

Study Gaps

1. What specific challenges are facing Africa's biodiversity and socio-economic landscape?

- 2▯ What are the current initiatives or efforts being undertaken to preserve farmer-managed seed systems in East Africa?
- 3▯ What are the specific recommendations provided in the report for building inclusive farmer-managed seed frameworks?

Chapter 2

Synopsis

The Chapter discusses the evolution of seed management systems throughout history, from traditional practices of indigenous communities to the emergence of commercial agriculture and genetically modified seeds. It highlights the differences between commercial seeds, farmer-managed seeds, and indigenous seeds in terms of ownership, control, adaptability, cost, and cultural significance. The importance of seed sovereignty, advocating for local control and traditional knowledge, is emphasized, especially in Africa where the ABN and AFSA Seed Policy work aims to guide advocacy and policy initiatives.

Furthermore, the text delves into the regulatory frameworks and policies governing seed management in Kenya, Uganda, and Tanzania. It explains the concept of seed systems and the interplay between formal and farmer-managed systems. Despite the significance of farmer-managed seed systems in maintaining high seed diversity and ensuring food security, challenges such as legal frameworks favouring commercial seeds and lack of documentation of their economic contribution persist.

Moreover, the text discusses seed security and sovereignty in East Africa, highlighting the importance of farmer's rights, access to resources and knowledge, and participation in decision-making. It explains the role of international treaties like the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA] in protecting farmer's rights and promoting food sovereignty. The similarities and differences between seed security and sovereignty are outlined, emphasizing the need for a bottom-up approach driven by farmers themselves to ensure resilience, diversity, and self-reliance in seed management

The chapter underscores the importance of recognizing and supporting farmer-managed seed systems and indigenous knowledge to achieve seed sovereignty and food security in East Africa.

Critical questions raised:

1. Ownership and Control Dynamics:
 - How do the ownership and control dynamics between commercial seeds, farmer-managed seeds, and indigenous seeds impact farmers' autonomy and rights?
 - What are the implications of high levels of IP protection for commercial seeds compared to the low or non-existent protection for farmer-managed and indigenous seeds?
2. Regulatory Frameworks:
 - How effective are the existing regulatory frameworks in addressing the diverse needs and characteristics of each seed category?
 - What gaps exist in the regulations regarding intellectual property rights, seed marketing, and farmers' rights, especially concerning farmer-managed and indigenous seeds?
3. Seed Security and Sovereignty:
 - How do seed security and seed sovereignty intersect, and what are the practical implications of prioritizing one over the other?
 - What are the challenges and opportunities in transitioning from a seed security-focused approach to a seed sovereignty-focused approach, particularly in East Africa?
4. Gender and Cultural Marginalization:
 - How do gender disparities and cultural marginalization affect access to and management of seeds, particularly indigenous seeds?
 - What strategies are needed to address these disparities and ensure equitable participation in decision-making regarding seed management?
5. Documentation and Quantification:
 - What are the economic contributions of farmer-managed seed systems to local food security and the national economy, and why haven't these contributions been documented or quantified?
 - How can the mapping of local food self-sufficiency be prioritized, and what data is necessary to demonstrate the economic significance of farmer-managed seed systems?

6. International Legal Frameworks:

- How effectively do international legal frameworks such as the International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA] address the rights and needs of small-scale farmers in East Africa?
- What are the challenges in implementing and enforcing these frameworks at the national level, and how do they align with local contexts and priorities?

7. Resilience and Adaptation:

- How do different seed categories contribute to resilience in the face of climate change, ecological degradation, and other environmental stressors?
- What are the mechanisms for enhancing the adaptive capacity of farmer-managed and indigenous seed systems to ensure long-term food security?

8. Corporate Influence and External Dependencies:

- What are the risks associated with corporate control of seed systems, and how can these risks be mitigated to ensure farmers' autonomy and sovereignty?
- How can external dependencies on seed aid programs be reduced, and what are the alternatives for building local seed sovereignty and resilience?

Addressing these questions and gaps is crucial for developing comprehensive policies and strategies that promote equitable, resilient, and sustainable seed systems in East Africa.

Chapter 3

Synopsis

The Chapter discusses the complex status of indigenous seeds in East Africa, highlighting both progress and challenges. It acknowledges the growing recognition of indigenous seeds for their resilience to climate change, pest and disease resistance, and nutritional value. Farmers and researchers are increasingly valuing their contribution to food security and biodiversity. However, there are challenges such as gene hunters raiding germplasm, erosion of traditional knowledge, and legal frameworks hindering seed diversity.

Initiatives promoting indigenous seeds are underway, including research, farmer training, and market development. Local farming communities are establishing seed banks to conserve and share indigenous varieties. Despite lacking legislative support, these efforts aim to preserve germplasm diversity.

Commercially produced hybrid seeds pose a challenge to the adoption of indigenous varieties, especially for maize and rice. However, organizations like the Ugandan

National Agricultural Research Organization and the Tanzania Organic Agriculture Movement support the growth and marketing of indigenous crops.

In both Kenya and Tanzania, farmer-managed seed systems (FMSS) are crucial for seed access, with FMSS being the major source of seeds for various crops. While Kenya shows indications of seed reform policies, more support is needed to recognize farmers' rights to save, share, and exchange seeds.

The future of FMSS and indigenous seeds depends on continued support from farmers, researchers, and policymakers to ensure food security and agricultural biodiversity for future generations.

Critical questions raised:

- 1□ Conservation and Preservation: How can indigenous seeds be conserved and preserved amidst challenges such as the erosion of traditional knowledge and the impact of legal frameworks like UPOV '91?
- 2□ Legal Frameworks and Policies: What are the implications of legal frameworks like UPOV '91 and the lack of supporting legislative frameworks (FMSS) on the conservation and utilization of indigenous seeds? How can policy reforms better support FMSS and indigenous seeds?
- 3□ Traditional Knowledge and Practices: How can the erosion of traditional knowledge and practices associated with indigenous seeds be addressed, especially concerning younger generations' shift away from traditional agriculture?
- 4□ Seed Exchange Systems: How can seed exchange systems be maintained and supported to ensure continued access to indigenous seed diversity, especially considering the promotion of commercially produced hybrid seeds?
- 5□ Commercialization vs. Resilience: How can the promotion of commercially produced hybrid seeds be balanced with the adoption of less productive but more resilient indigenous varieties, particularly for major crops like maize and rice?
- 6□ Community Engagement and Support: What roles can organizations, such as the CSO Network in Kenya and the Tanzania Organic Agriculture Movement, play in promoting the conservation, utilization, and exchange of indigenous seeds within local communities?
- 7□ Access and Affordability: How can access to indigenous seeds from Farmer Managed Seed Systems (FMSS) be improved, especially considering their affordability and availability compared to seeds from commercial sources?
- 8□ Future Policy Directions: What are the potential future policy directions needed to support FMSS and indigenous seeds, as demonstrated by the indications of seed reform policies in Kenya?

- 9▯ Collaboration and Stakeholder Engagement: How can farmers, researchers, policymakers, and organizations collaborate to ensure the continued support and sustainability of FMSS and indigenous seeds for future generations?
- 10▯ Impact on Food Security and Biodiversity: What are the potential consequences on food security and agricultural biodiversity if FMSS and indigenous seeds are not adequately supported and preserved?

Chapter 4

Synopsis

The first part of this long chapter discusses the international Seed Sector Regulatory Framework (SSRF), which includes policies, legislation, institutional arrangements, and standards and procedures to regulate the seed sector. It begins by discussing the good legislation supportive of national sovereignty over genetic heritage and continues onto frameworks that aim to ensure benefits and protect farmers' rights. The Seed sector frameworks in East Africa have faced criticism for their lack of adaptability, particularly in Kenya. International frameworks such as the CBD, ITPGRFA, and Nagoya Protocol aim to protect farmers' rights, biodiversity, and traditional knowledge related to seeds. Additionally, UNDRIP and UNDROP recognize indigenous peoples' and peasants' rights to seeds and biodiversity. The passage emphasizes the importance of supporting farmer-managed seed systems and enacting policies that uphold farmers' rights to ensure sustainable food systems.

The second part of this chapter examines the impact of various international agreements and conventions, such as the UPOV Convention and the TRIPS Agreement, on the rights of farmers and the conservation of biodiversity, particularly in the context of plant breeding and seed systems. It highlights how commercial interests, particularly those of large agrochemical and seed corporations, have shaped these agreements to favour uniformity and privatization of genetic resources, often at the expense of indigenous knowledge, farmer autonomy, and biodiversity conservation.

Key points include DUS Criteria and Seed Industry Practices that support patents and breeder right protection for commercial industrial seed systems (UPOV Convention) and the Impact on Farmers and Biodiversity: The section highlights concerns about the loss of genetic diversity, the erosion of traditional knowledge, and increased dependence on

commercial seed varieties, which can make farmers more vulnerable to pests, diseases, and climate change.

This first section also discusses alternatives and flexibilities in the UPOV convention. It discusses the potential for sui generis systems of plant variety protection, which could provide tailored solutions to address the needs of small-scale farmers and promote biodiversity conservation. Of the three East African countries, only Uganda has an opportunity for a Sui generis UPOV alternative. The chapter urges that the East African legislature can provide the missed protection provisions and lend credit to Uganda for a similar approach.

This section underscores the importance of finding a balance between protecting breeders' rights and ensuring farmers' access to diverse and adaptable seeds for sustainable agriculture. It also emphasizes the need for greater public participation and consideration of local contexts in the development and implementation of international agreements and national policies related to plant breeding and seed systems.

Critical questions?

- 1□ How do commercial seed industries utilize DUS [Distinctiveness, Uniformity, Stability] guidelines to acquire proprietary rights over plant varieties, and what are the implications of this practice?
- 2□ What are the differences between inbreeding, outbreeding, and hybridization in plant breeding, and how do they impact genetic diversity, productivity, and resilience?
- 3□ How does the removal of the term "newness" from the UPOV Convention affect the protection of plant varieties, and what are the potential consequences of this change?
- 4□ What are the implications of the TRIPS agreement on food and seed rights, particularly concerning access to seeds for small-scale farmers in East Africa?
- 5□ How does the adoption of different UPOV conventions, such as UPOV'78 and UPOV'91, affect farmers' rights, traditional knowledge, and access to seeds in various countries?
- 6□ What are the arguments for and against adopting a sui generis system for plant variety protection, particularly in countries like Uganda, and how do such systems differ from the UPOV Convention?

- 7▯ How has the UPOV Convention been utilized to impact indigenous and farmers' rights to seeds, and what are the criticisms against its guidelines and development assistance programs?
- 8▯ What are the potential consequences of the UPOV guidelines on Utility and Essentially Derived Varieties, as well as the Guidelines on Examination of Newness/Novelty, particularly concerning the development of new plant varieties and the protection of traditional varieties?
- 9▯ How do different countries' decisions regarding UPOV adoption reflect their priorities and concerns regarding agricultural development, biodiversity conservation, and farmers' rights?
- 10▯ In what ways can TRIPS flexibilities and UPOV exemptions be utilized to protect the rights of small-scale farmers and promote sustainable agriculture?

Chapter 6

Synopsis

The passage discusses the importance of National Seed Sector Frameworks in regulating and guiding seed development, distribution, and management within countries. It emphasizes the need for these frameworks to encompass biological characteristics, socio-cultural context, and legal considerations of seeds. The passage also compares the progress of East African countries, highlighting Kenya's advanced stage in creating legislation supporting the commercial seed industry, while Uganda and Tanzania are at various stages.

Criticism is directed at Kenya's Seed and Plant Varieties Act [2012] for undermining farmers' rights, favouring commercial over farmer-managed seed systems, and being restrictive on introducing new plant varieties. It also points out inadequate consultation during its development and inconsistency with international law. Uganda and Tanzania are noted for their legislative frameworks and policies supporting farmer-managed seed systems.

The passage mentions amendments to the Kenyan Seed Protection Act of 2012 to include farmers' rights and the role of intellectual property rights in protecting indigenous knowledge. It discusses changes in seed regulations in Kenya, particularly the proposed introduction of Standard Seed, and how they impact farmers and informal seed systems.

Tanzania's seed sector operates under a multifaceted framework, including legislative acts, regulations, and international harmonization efforts, with recognition of farmer-managed seed systems. Uganda's framework includes legislative acts, national policies, institutional structures, and regional harmonization initiatives, also supporting farmer-managed seed systems. Both countries benefit from international assistance in strengthening their seed systems.

GAPS

- 1▢ What are the specific measures that need to be taken to revise The Kenyan Seed and Plant Varieties Act [2012] to protect farmers' rights to seed and biodiversity?
- 2▢ What are the negative impacts of introducing new plant varieties without a license from the government?
- 3▢ What are the potential benefits of including farmer-managed seed systems and indigenous seeds in the Kenyan Seed and Plant Varieties Act [2012]?

Despite these challenges, there are several things that governments can do to close the policy gaps and support farmer-managed seed systems. These include:

- 1▢ Review and revise national seed policies and laws to ensure that they recognize and support farmer-managed seed systems.
- 2▢ Reform intellectual property laws to ensure that they do not unduly restrict farmers' rights to seed and biodiversity.
- 3▢ Improve access to public sector germplasm for farmers.
- 4▢ Strengthen enforcement of farmers' rights.
- 5▢ Increase investment in research and development on farmer-managed seed systems.
- 6▢ Raise awareness and understanding of farmer-managed seed systems among policymakers and government officials.
- 7▢ Build capacity to implement policies that support farmer-managed seed systems.

Work with the Commercial [Industrial] seed sector to develop mutually beneficial partnerships.

Chapter 7

Synopsis

The chapter discusses the stakeholders involved in the East African seed sector and their roles, interests, and influence. Various methods such as desktop review, surveys, interviews, and mapping were used to analyze stakeholders and their concerns. Stakeholders include farmers, seed companies, governments, NGOs, researchers, consumers, indigenous communities, financial institutions, intergovernmental organizations, regional organizations, the private sector, and civil society organizations.

The CGIAR system, particularly with the increased funding from the Bill & Melinda Gates Foundation [BMGF], plays a crucial role in seed sector frameworks, influencing policies and guiding principles globally. However, concerns arise regarding the BMGF's influence and potential negative impacts such as corporate control over seeds and dependence on external inputs. The passage also highlights the roles and contributions of intergovernmental organizations like the FAO and WTO, as well as regional organizations and the private sector.

In Tanzania, key stakeholders include government bodies like the Ministry of Agriculture and the Tanzania Official Seed Certification Institute, along with associations like the Tanzania Seed Trade Association. In Uganda, stakeholders include government entities like the Ministry of Agriculture and the National Agricultural Research Organization, as well as NGOs like Farm Radio International and ActionAid.

The passage acknowledges the significant role of the BMGF in transforming the seed sector in Africa through funding and partnerships, but it also raises concerns about potential negative consequences such as the neglect of traditional varieties and farmer-driven systems, as well as corporate dominance and reliance on external inputs.

Critical questions raised

The chapter raises several critical questions regarding the stakeholders involved in the East African seed sector:

1. Identification and Understanding of Stakeholders: How can stakeholders in the East African seed sector be effectively identified and understood?
2. Roles and Interests of Stakeholders: What roles do stakeholders play in the seed sector, and what are their interests?

3. Interconnectedness and Interdependency of Stakeholders: How are stakeholders interconnected and interdependent within the seed sector framework?
4. Influence of Key Players like CGIAR and BMGF: What is the influence of key players like the CGIAR system and the Bill & Melinda Gates Foundation "BMGF" in shaping the seed sector?
5. Concerns about Corporate Control and External Dependency: What are the potential negative impacts of corporate control over seeds and dependence on external inputs in the seed sector?

These questions are crucial for understanding the dynamics, challenges, and potential implications of various stakeholders' involvement in the East African seed sector.

Chapter 8

Synopsis

The section discusses the challenges and dynamics of food sovereignty and farmer-managed seed systems "FMSS" in Kenya, Uganda, and Tanzania. In Kenya, there's a significant rise in food imports due to factors like population growth and urbanization, leading to strains on the economy and traditional food crops. The increasing urbanization trend exacerbates reliance on imports, making Kenya vulnerable in terms of food security. However, there's hope in the rising middle class's preference for sustainable diets and organic foods, potentially driving demand for traditional foods and FMSS.

In contrast, Uganda has made progress towards food self-sufficiency, with a significant rural population heavily reliant on agricultural structures and traditional FMSS. Tanzania's situation is not explicitly discussed in the provided passage.

Critical questions raised:

1. What are the primary factors contributing to Kenya's increasing food import bill over the past three decades?
2. How do changing dietary patterns and lifestyles away from traditional food crops affect Kenya's food sovereignty and farmer-managed seed systems "FMSS"?
3. What are the implications of Kenya's urbanization rate on its food security and reliance on imported food items such as wheat, rice, and maize?

4. How does the reliance on imported wheat and rice further strain Kenya's maize production, and what are the potential consequences?
5. What challenges and opportunities do agroecology, particularly about FMSS, present for Kenya's food sovereignty, especially in rural areas?
6. In what ways does Kenya's rising middle-income class and demand for sustainable diets, including organic foods, impact the potential for agroecological farming practices and FMSS?
7. What are the similarities and differences between Kenya, Uganda, and Tanzania regarding their urbanization rates, agricultural structures, and FMSS?
8. How has Uganda's progress towards food self-sufficiency impacted its reliance on traditional farmer-managed seed systems, and what lessons can be drawn from its experience?
9. What are the key factors contributing to Uganda's transition from being food insecure to potentially becoming a net exporter of food, as indicated by the Uganda Bureau of Statistics [UBOS]?
10. How might the projected increase in Uganda's urbanization rate by 2050 affect its agricultural practices, food security, and reliance on traditional farmer-managed seed systems?

Chapter 9

Synopsis

The current seed legislation in Tanzania primarily focuses on the commercial farming sector, neglecting the concerns of smallholder farmers. This emphasis on commercialization threatens the traditional practices of seed sharing and exchange among small farmers, leading to increased dependency on external inputs. To support smallholder farmers and traditional farming practices, recommendations include documenting traditional knowledge, promoting the use of traditional seeds, supporting community-based seed banks, and raising awareness of the importance of farmer-managed seed systems [FMSS].

In East African countries, input subsidy programs [ISPs] have been implemented to support agricultural productivity, mainly for commercial operations. However, these programs have been criticized for their high cost, potential market distortions, and lack of support for agroecological farming. Concerns include corruption, mismanagement, and diversion of subsidized inputs. While ISPs have been successful in boosting

productivity, there are doubts about the quality of the certified seeds provided, with reports of low yields and suggestions that seeds from local community seed banks might be more suitable. Calls are made to redirect subsidy funds towards supporting FMSS and community seed banks, emphasizing the need for a more inclusive and sustainable approach to agricultural development.

Critical questions raised:

1. Equity and Inclusivity:
 - How equitable and inclusive are the current seed legislation and input subsidy programs in Tanzania, Kenya, and Uganda towards smallholder farmers and agroecological farming practices?
 - Are there mechanisms in place to ensure that smallholder farmers are not marginalized or excluded from accessing improved seeds and agricultural inputs important to their agroecological practices?
 - To what extent do these policies and programs address the needs and rights of smallholder farmers and FMSS?
2. Impact on Traditional Farming Practices:
 - How do the current legislative frameworks and subsidy programs impact traditional farming practices such as seed sharing and exchange among smallholder farmers?
 - What are the short-term and long-term consequences of prioritizing commercial farming interests over supporting FMSS and traditional farming practices?
3. Legal Environment and Policy Support:
 - How favourable is the legal environment for informal seed systems in East African countries, and what reforms are needed to better recognize and support FMSS?
 - How can policy frameworks be improved to provide adequate support and funding for FMSS, community-based seed banks, and agroecological farming initiatives?
4. Effectiveness of Input Subsidy Programs:
 - What is the effectiveness of input subsidy programs in increasing agricultural productivity, particularly in smallholder farming contexts?
 - To what extent do input subsidy programs contribute to market distortions and potential overreliance on chemical fertilizers, and how can these issues be mitigated?

- How can input subsidy programs be redesigned to better support FMSS, community seed banks, and agroecological farming practices, ensuring they reach the intended beneficiaries and promote sustainable agricultural development?
5. Governance and Accountability:
- What measures are in place to address concerns regarding corruption, mismanagement, and leakage of subsidized inputs within input subsidy programs?
 - How can transparency, accountability, and proper governance be ensured in the implementation of subsidy programs to maximize benefits for smallholder farmers and FMSS?
6. Long-Term Sustainability:
- What are the long-term implications of input subsidy programs on soil health, environmental sustainability, and agricultural resilience?
 - How can input subsidy programs be made more financially sustainable while still effectively supporting agricultural development and smallholder farmers' needs?

Addressing these critical questions can help guide policymakers, development agencies, and stakeholders in formulating more inclusive, sustainable, and effective policies and programs to support smallholder farmers, FMSS, and agroecological farming practices in East Africa.

Chapter 10

Synopsis

Challenges persist within Farmer-Managed Seed Systems (FMSS), hindering their development and efficacy. National seed policies predominantly cater to the Commercial (Industrial) sector, neglecting the specific needs of FMSS. This oversight results in legal and regulatory obstacles, limiting farmers' access to crucial resources like funding, research opportunities, and knowledge exchange platforms. Additionally, stringent intellectual property laws impede farmers' rights to save, utilize, and exchange seeds, exacerbating their vulnerability to exploitation. Access to germplasm, vital for breeding, is constrained by restrictive licensing and insufficient funding.

Despite supportive policies, implementation encounters various challenges. Policymakers often lack awareness of FMSS intricacies, leading to policies that undermine them. Governments face limitations in resources and expertise to effectively support FMSS. Furthermore, resistance from the Commercial seed sector poses further impediments, to protecting their vested interests.

To address these issues, several solutions are proposed. Firstly, countries in East Africa should revise their seed policies to recognize and support FMSS. Intellectual property laws should be reformed to safeguard farmers' rights and traditional knowledge. Efforts to improve farmer access to germplasm collections are essential. Capacity building for policymakers and enforcement of existing laws protecting farmers' rights are crucial. Increased investment in FMSS research and development is urgently needed, along with capacity building for farmers and extension workers. Collaboration and harmonization of all seed sector frameworks are necessary to develop clear definitions of FMSS, promote policy integration, and facilitate equitable benefit-sharing mechanisms for farmers. Ultimately, these actions aim to strengthen FMSS, ensuring agricultural resilience and sustainability in the long term.

Critical questions raised

The chapter raises several critical questions regarding the challenges faced by Farmer-Managed Seed Systems (FMSS) and proposes actionable solutions:

1. Policy Neglect: How can national seed policies be revised to recognize and support FMSS, thereby overcoming legal and regulatory barriers and enhancing farmers' access to essential resources?
2. Intellectual Property Barriers: What reforms are needed in intellectual property laws to ensure the protection of farmers' rights and traditional knowledge, and how can weak enforcement be addressed to prevent exploitation?
3. Limited Germplasm Access: What measures can be taken to improve farmer access to public sector germplasm collections, considering obstacles such as restrictive licensing and inadequate funding?
4. Implementation Challenges: How can awareness among policymakers about FMSS be improved to prevent the crafting of policies that undermine them? Additionally, how can governments overcome capacity limitations to effectively

support FMSS, and how can resistance from the commercial seed sector be mitigated?

5. Enforcement of Existing Laws: How can existing laws protecting farmers' rights be strengthened through constitutional recognition and the enactment of missing policies and legislation?
6. Investment and Research: What strategies are needed to increase investment in FMSS research and development to integrate science into community seed banks and grassroots food systems?
7. Capacity Building: How can farmers and extension workers be equipped with the necessary knowledge and skills to effectively engage in FMSS?
8. Collaboration and Harmonization: How can seed sector frameworks be collaboratively developed and harmonized to provide clear definitions and recognition of FMSS, promote policy integration and mainstreaming, facilitate technical and financial support for local seed security, and ensure equitable benefit-sharing mechanisms for farmers? Additionally, how can participatory research and breeding approaches be promoted within this framework?