Agriculture & Food Systems
SDC Thematic Network

How to:
Seed systems

A guide to supporting seed sector development for food system outcomes.

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What can you find in this document?

This guide provides practical direction for strengthening seed systems as a key pathway to resilient and sustainable food systems, particularly in the Global South. It underscores the importance of improving farmers' access to quality seed of improved and locally adapted varieties in response to global challenges such as climate change, food insecurity, and agrobiodiversity loss. Emphasising a pluralistic approach, it supports interventions in formal, intermediary, and farmer-managed systems, recognising the diverse needs of farming communities. Interventions are structured around an integrated seed sector and food systems framework built on eight core functions: production, value addition and distribution, service provision, utilisation, stakeholder organisation, regulation, coordination, and funding. Each function is illustrated with strategic recommendations and global case studies. The report promotes inclusive policies, local capacity building, public-private collaboration, and attention to gender and participation. Commissioned by the Swiss Agency for Development and Cooperation (SDC), it serves as a tool for designing effective interventions to enhance seed security and food system resilience.

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1 Seed sector development: significance, definitions and approaches

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1.1. Importance of quality seed

Population growth, climate stress, global conflicts and resource scarcity

The rapid growth of the global population is increasing demand for agricultural production, particularly in the Global South, where food security remains a critical challenge. At the same time, climate change is intensifying pressure on farming systems. Rising temperatures, extreme weather events—including floods, droughts, and heatwaves—and shifting rainfall patterns are threatening crop yields and agricultural stability.

These challenges are further compounded in fragile contexts affected by conflict or displacement. Pandemics such as COVID-19 have exposed vulnerabilities in global food systems. Meanwhile, growing competition for key resources like arable land and water is constraining agriculture's ability to meet rising food demands sustainably. In response, urgent adaptation strategies, technological innovation, and enabling policies are needed to build resilient and sustainable food systems. Protecting agrobiodiversity is also critical, as its continued loss poses a major risk to both food security and long-term resilience.

Use of quality seed enhancing agricultural productivityand resilience

One of the most effective ways to boost agricultural productivity is through the use of high-quality seed from improved and locally adapted varieties. A wide range of seed types is needed to support diverse cropping systems and farmer needs.

Seed lies at the foundation of agricultural production and food security. Without seed security, food security is not possible. High-quality seed contributes to better yields, climate resilience, and nutritional value—making it a central element of sustainable agriculture. (See Box 1 for definitions of "seed," "variety," and "quality seed".)

Box 1

Definitions of commonly used seed-related terms in agriculture

- Seed is a general term for all reproductive materials across different plant species. It includes actual seeds, such as those of rice, maize, and sorghum, as well as vegetatively propagated materials like banana suckers, cassava cuttings, and potato tubers.
- Variety refers to a distinct population within a plant species, defined by specific traits that are expressed through the genetic background and environmental influences. These traits may develop over time through farmer selection and cultivation, resulting in a farmers' variety, also mentioned local variety, or they may be the outcome of breeding programmes conducted by national or international research institutes or private companies, leading to an improved variety.
- Quality seed is genetically pure, has a high germination rate, is free from pests and diseases, and has proper moisture content and weight. It ensures strong germination, rapid emergence, and vigorous growth. Quality seed can be produced by farmers, cooperatives, seed companies, and other stakeholders. It can be officially certified or monitored with other quality standards.
- Seed system refers to the technologies, organisational structures, and market and non-market mechanisms that enable farmers to access seeds. It encompasses both farmer-managed systems and formally structured public and private seed systems.
- Seed sector comprises multiple seed systems, seed value chains, and related activities.

Quality seed enhances crop resilience by enabling farmers to better cope with climate change and environmental stresses. For cash crops, investing in quality seed offers high returns, making it an attractive option for smallholders aiming to increase income. For food security crops, quality seed boosts both yield and nutritional value, improving household food supply.

Across the Global South, large yield gaps persist. Experts estimate that up to 50% of these gaps can be closed by adopting quality seed of improved and adapted varieties, while the remaining 50% depends on complementary practices such as fertiliser use, irrigation, and improved soil management. Addressing both seed and agronomic factors is essential to achieving sustainable agricultural development under increasing global pressures.

Physical seed quality

Seed quality encompasses two key aspects: physical and genetic quality; see Figure 1. Physical quality refers to the seed's ability to germinate reliably, and its freedom from weed seeds, pests, and diseases. It also means the seed is "true to type"—matching the variety expected by the farmer.

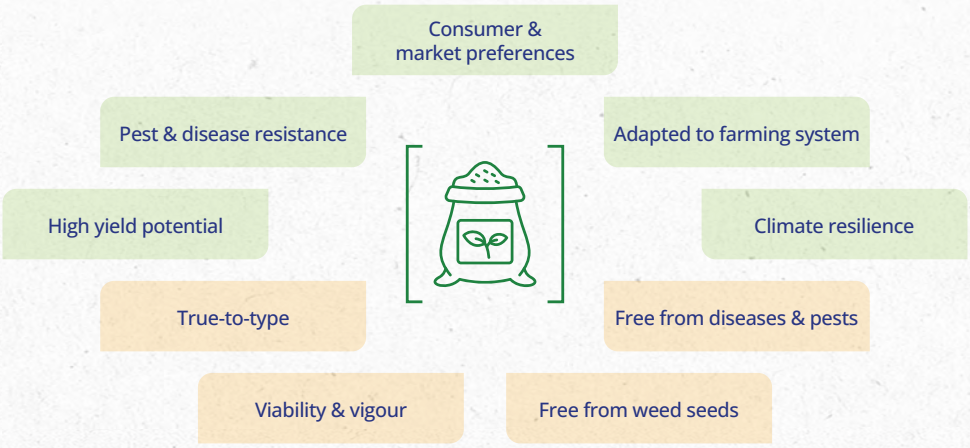
Farmers often manage physical seed quality through their own informal practices. In formal seed systems, however, more rigorous internal quality control is applied, along with external quality assurance such as seed certification. Both farmer-managed and formal systems can produce high-quality seed when sound production and handling practices are followed. (See chapter 2.3 on seed service provision, and chapter 2.6 on seed sector regulation for more on quality assurance.)

Genetic seed quality

Genetic quality refers to the traits carried by the seed—such as yield potential, resistance to pests and diseases, and desirable processing or consumption qualities. These traits are determined by the variety and directly influence crop performance.

Developing and promoting improved, locally adapted varieties is essential for climate resilience and productivity, especially in rainfed systems. Agrobiodiversity is a vital resource in this process, providing the genetic foundation for ongoing crop improvement. Farmer-managed seed systems are key to conserving this diversity and must be recognized and supported as critical contributors to resilient, adaptive agriculture.

Figure 1. Seed quality characteristics
Note: Orange represent physical seed quality characteristics; green indicate genetic quality characteristics (i.e. variety traits). Source: Thijssen, ISSD course materials



1.2. Supporting the development of a pluralistic seed sector

Quality seed through different seed systems

Beyond physical quality and varietal traits, seed must also be available at the right time, in the right place, in the right quantity, and at an affordable price. Meeting these conditions depends on well-functioning seed systems (see Box 1 for a definition).

Farmers have diverse seed needs across many crops and varieties—and they are not a homogeneous group. Farmers' seed requirements vary based on agroecological conditions, cropping systems, gender, income, and market orientation. This diversity is served by a range of seed systems. For example, a single farmer might save part of its sorghum harvest for replanting, obtain bean seed from a community-based seed scheme, buy maize seed from a domestic company, and purchase tomato seed from an international supplier. These examples highlight how multiple seed systems often operate in parallel to meet a farmer's needs.

Approaches such as pluralistic seed sector development (CROPS4HD, 2023), integrated seed sector development (Louwaars and de Boef, 2012), and development of resilient and inclusive seed systems (Westengen et al., 2023; AfricaSeeds, 2023) all build on the recognition of this seed system diversity. They emphasise that multiple systems coexist within the broader seed sector (see Box 1). A pluralistic approach acknowledges that each seed system—whether formal, intermediary, or farmer-managed—has its own strengths and limitations.

Rather than promoting a one-size-fits-all model, pluralistic seed sector development supports tailored interventions based on how seed is produced, exchanged, and used by different groups of farmers. This approach ensures that the seed sector can more effectively respond to diverse needs, while also supporting farmer adaptation to changing environments and evolving market opportunities.

Farmer-managed, formal and intermediary seed systems

Farmer-managed seed systems play a crucial role in providing access to seed for less market-oriented crops, particularly those that are self-pollinating or vegetatively propagated. Common crops include small grains, root and tuber crops, and local vegetables—many of which are well-suited to on-farm seed production. In these systems, farmers save, exchange, and sell seed from improved, recycled, or local varieties. For many smallholders, farm-saved or informally sourced seed remains the primary option, especially where formal seed systems are unaffordable or inaccessible. Across much of Africa and Asia, farmer-managed seed systems—including seed obtained from local markets—continue to serve as the dominant source of planting material (Sperling et al., 2020). These systems are also central to the concept of seed sovereignty, empowering communities to maintain control over their genetic resources, cultural practices, and food systems in the face of growing pressure from commercial and regulatory frameworks (AFSA et al., 2023).

Formal seed systems are typically structured and commercially oriented, providing access to certified seed—particularly for cross-pollinating crops and hybrid varieties. Crops such as hybrid maize and hybrid vegetables are commonly produced and distributed through these systems. Activities within formal seed systems are regulated and follow a clearly defined value chain, from variety development and seed production to certification and marketing. Official quality assurance mechanisms are in place to ensure seed meets established standards. These systems play a key role in commercial agriculture and in scaling access to improved varieties.

Intermediary seed systems operate between formal and farmer-managed systems, supplying quality seed for a range of crops, including legumes, rice, and vegetatively propagated crops. These systems typically have lower profit margins and often serve crops or regions not prioritised by commercial companies. They are commonly led by farmer groups, local entrepreneurs, or development organisations, often with support from public institutions. Quality assurance is typically organised at the local level, and linkages to formal structures—such as research institutes, regulatory bodies, seed inspection services, and financial institutions—are often limited, informal, or temporary. Intermediary systems play an essential role in increasing access to quality seed in underserved markets.

Principles that guide a pluralistic seed sector development approach

To support the design of interventions in a pluralistic seed sector, the team at Wageningen University & Research (WUR) and partners have developed eight guiding principles (see Box 2). While originally formulated for the integrated seed sector development (ISSD) approach, these principles are equally relevant to other strategies promoting pluralism in seed sector development. The overarching goal is to meet the diverse needs of farmers in low- and middle-income countries across Africa, Asia, and Latin America—by expanding their access to a wider choice of crop varieties, seed quality levels, and price points.

Box 2
ISSD guiding principles

- Foster pluralism and build programmes on a diversity of seed systems
- Work according to the structure of the seed value chain
- Promote entrepreneurship and market orientation
- Recognise the relevance of informal seed systems
- Facilitate interactions between informal and formal seed systems
- Recognise the complementary roles of the public and private sectors
- Support enabling and evolving policies for a dynamic sector

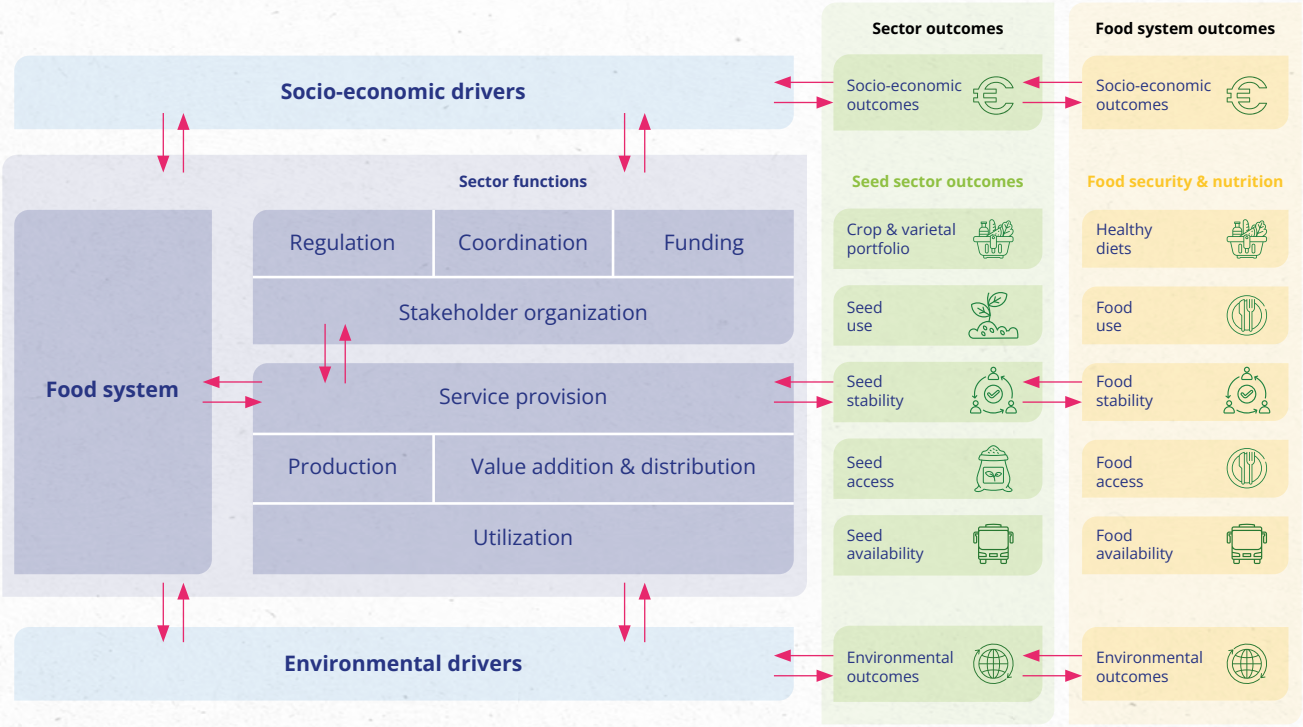
Source: Adapted from ISSD Africa

1.3. Integrated seed sector and food systems framework

Integrating seed sectors into food systems

Improved seed systems and stronger seed sector performance can contribute significantly to more resilient and inclusive food systems. As the food systems approach gains traction, *the integrated sector and food systems framework has emerged as a valuable tool for applying systems thinking* (Borman et al., 2022). This framework builds on the traditional value chain concept but takes a broader perspective. It integrates governance, market dynamics, environmental conditions, and social dimensions—offering a more holistic lens. It provides a comprehensive approach to transforming individual agro-food sectors, including the seed sector, by embedding them within the wider food system context.

Figure 2. Integrated sector and food system framework
Source: De Boef and Thijssen (2023)



Seed sector development aims to increase farmers' use of quality seed, ensure a secure and timely seed supply, and expand access to a diverse range of crops and varieties. These outcomes contribute directly to food security and healthier diets. In addition, seed sector development can generate employment, support equitable income opportunities, and enhance socio-economic well-being. It also plays a role in climate change adaptation, biodiversity conservation and management, and overall system resilience. Together, these outcomes contribute to improved planetary health (see Figure 2). Aligning seed sector development with broader food system goals enables more purposeful and integrated transformation.

Ambition of seed sector functions

Within the integrated framework, the seed sector is organised around eight key functions, each of which plays a critical role in its overall performance. Table 1 presents these functions along with their corresponding ambitions, tailored specifically to the seed sector. When developing a national seed sector strategy or seed road map, these functions provide a comprehensive framework. They serve as a safeguard to ensure that all dimensions of seed production, distribution, and sector governance are addressed in the problem analysis and reflected in targeted solutions (De Boef and Thijssen, 2023). In this document, the eight functions also structure Chapter 2, which focuses on how to strengthen seed sector development to support broader food system outcomes.

Table 1. Ambition of seed sector functions
Source: Adapted from De Boef and Thijssen (2023)

Function	Ambition
Production	Seed production systems are viable and sustainable, and cover all crops
Value addition and distribution	Seed value chains and seed markets are profitable, efficient, fair and transparent
Service provision	High quality, inclusive and differentiated services are provided to seed producers and stakeholders in seed value chains
Utilisation	Farmers' use of quality seed of improved and preferred varieties is increased
Stakeholder organisation	Stakeholders are organised covering seed production and marketing, seed markets, seed sector regulation, seed quality assurance, services and promotion of use
Regulation	Rules and systems are in place for effectively governing seed production systems, seed markets, seed service provision, sector coordination, and seed use
Coordination	Appropriate seed sector governance and coordination mechanisms are in place, which result in alignment and accountability among different seed sector stakeholders
Funding	The seed sector has the capacity to generate revenues and make strategic reinvestments

1.4. Specific interest of SDC in seed systems

The Swiss Agency for Development and Cooperation (SDC) has a strong interest in seed sector development, recognising the critical link between seed security, food security, and resilience—including the role of seed within the Humanitarian-Development-Peace (HDP) Nexus. As outlined in the sections above, supporting seed sector transformation contributes to poverty alleviation, food security, and improved nutrition for all—core elements of SDC's mandate.

Seed sector development also intersects with major global challenges such as agrobiodiversity conservation and climate change adaptation. Smallholder farmers—who produce over 70% of the food consumed in Asia and sub-Saharan Africa—are among the most vulnerable to both agrobiodiversity loss and climate impacts.

This document is intended to equip SDC and its partners with concepts and frameworks for navigating the complexities of the seed sector. It offers guidance on designing and implementing effective interventions through various entry points, addressing key sector functions from seed production to seed sector regulation. It highlights good practices and provides resources for further exploration. The guide draws on examples from ISSD-inspired programmes in which WUR has played a role, and includes cases from SDC-supported initiatives.

References and additional resources

- *AfricaSeeds, 2023. Inclusive seed sector development for sustainable agricultural transformation in Africa.*
- *AFSA et al., 2023. Seed sovereignty: A viable option for food and nutritional security in Africa.*
- *Borman et al., 2022. Putting food systems thinking into practice: Integrating agricultural sectors into a multi-level analytical framework.*
- *CROPS4HD, 2023. Position paper on policies for pluralistic seed systems.*
- *De Boef et al., 2024. Special issue opening editorial: Designing, assessing and scaling approaches for integrated seed sector development.*
- *ISSD Africa. Short video on principles guiding integrated seed sector development.*
- *Louwaars and de Boef, 2012. Integrated seed sector development in Africa: A conceptual framework for creating coherence between practices, programmes and policies.*
- *Sperling et al., 2020. Informal seed traders: the backbone of seed business and African smallholder seed supply.*
- *Westengen et al., 2023. Navigating toward resilient and inclusive seed systems.*

2

How to strengthen seed sectors for food system outcomes

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This chapter explores how to strengthen or transform the seed sector by addressing its different functions or activity areas, as elaborated in the integrated seed sector and food systems framework. Each function is detailed in a separate subchapter, introducing the function and presenting good practices drawn from projects, programmes, and literature on how to strengthen it. Relevant examples, showcased in dedicated boxes, illustrate interventions across different seed systems. Throughout, the emphasis is on how these practices and examples ultimately benefit farmers as seed users. Each subchapter also provides references and additional resources for further reading.

It is important to note that some activities and projects may contribute to multiple seed sector functions, addressing them from different perspectives. The seed sector and food systems framework is used as a guiding tool to help capture and organise key activities within the seed sector as a whole.

2.1. How to strengthen quality seed production

Ambition

Since farmers require high-quality seed from a diverse range of crops and varieties suited to their agroecological and socioeconomic conditions, the ambition for seed production systems is to ensure they are viable, sustainable, and inclusive of all crop types. This seed sector function addresses both the what and how of seed production—considering the types of producers involved, their crop and variety focus, the functioning of seed markets, and the long-term sustainability of their operations.

The activity area further explained

A well-functioning seed sector accommodates a wide range of seed producers—including domestic enterprises, international companies, local businesses, community organisations, and individual farmers who integrate seed production into their cropping cycles. While farmer-managed seed systems are sometimes undervalued, they play a critical role in ensuring local seed availability and conserving agrobiodiversity.

Producing quality seed is different from growing crops for food. It requires strict management to ensure genetic purity, high germination rates, and seed health. This includes the use of foundation or basic seed, proper land preparation, crop isolation, pest and disease control, and post-harvest handling such as drying, cleaning, and storage. In formal seed systems, external inspectors monitor and test seed quality. In farmer-managed systems, quality is usually monitored by the producers themselves.

Where formal systems prioritise uniformity and genetic purity, farmers' varieties often retain a degree of genetic diversity. This diversity provides several benefits: it increases adaptability to climate variability, supports stable yields, and enhances resilience to pests and diseases. Farmers also engage in ongoing, in situ selection, keeping varieties aligned with their environments and conserving valuable genetic resources that may be overlooked in formal systems.

Good practices

Analyse the sector's seed systems

Seed systems analysis is a collaborative process that brings together multiple stakeholders to map and understand all seed-related activities in a country or region. It identifies how formal, informal, public, and private seed systems function and interact, while uncovering bottlenecks, overlaps, and gaps. By analysing crop types, quality control practices, seed flows, and farmer access, this process ensures that interventions are grounded in evidence and local realities. Conducting a system analysis before launching new programmes increases effectiveness, supports strategic planning, and aligns efforts with national seed sector development and seed security goals (De Boef and Thijssen, 2023).

Promote farmer-managed seed systems

Farmer-managed seed systems play a vital role in supporting local food security, especially in regions underserved by formal markets. These systems are built on generations of farmer knowledge, cultural traditions, and adaptation to local conditions. They support agrobiodiversity and enable seed access for diverse and under-commercialised crops. Strengthening these systems includes supporting seed saving, selection, and exchange practices, while integrating scientific approaches such as pest management and seed quality testing. Empowering farmer seed systems promotes local resilience, enhances seed sovereignty, and ensures that smallholders retain agency over their planting material (Wynberg, 2024). Despite their importance, these systems receive limited attention and are rarely the focus of dedicated development projects.

Support seed production in intermediary seed systems

Intermediary seed systems serve as a practical bridge between formal and farmer-managed approaches. They typically focus on producing quality seed for crops that are less commercially viable but critical for local nutrition and climate resilience. These systems integrate formal production standards with local knowledge and community distribution networks. Supporting them requires participatory research, targeted capacity building, and better access to early generation seed and quality assurance services. Policies that recognise and support decentralised seed entrepreneurship are essential for legitimising these systems and helping them thrive as sustainable, inclusive models.

Strengthen the performance of domestic seed enterprises

Domestic seed enterprises are essential for increasing access to certified seed, particularly for major crops like hybrid maize and for scaling publicly bred varieties. However, many face persistent challenges related to financing, infrastructure, technical expertise, and market development. Strengthening these enterprises requires comprehensive support, including business and production training, access to finance, investment in processing technologies, and stronger linkages to distribution networks (O'Connor Funk, 2009). Promoting partnerships and public procurement mechanisms can also help them reach underserved markets. Building robust domestic seed companies fosters local innovation and strengthens national seed sovereignty and resilience.

Example

Box 3

Recognition of farmer-managed seed systems in Africa

To strengthen policy support for farmer-managed seed systems, the African Union's African Seed and Biotechnology Programme (ASBP), together with DeSIRA-LIFT, commissioned a study in 2024 to highlight their value, challenges, and potential. The study urged policymakers to recognise the contributions of these systems and better integrate them with formal seed strategies.

It emphasised the role of farmers—particularly women—in conserving, selecting, producing, and exchanging seed suited to local environments and traditions. The diversity maintained in these systems is crucial for breeding efforts and climate adaptation. The study also documented support initiatives by NGOs, civil society, and governments: from community seed banks and farmer seed enterprises to alternative variety registration systems.

Ultimately, the study reinforced the importance of Farmers' Rights, food sovereignty, and the need for investments in both commercial and farmer-managed seed systems to ensure food and nutritional security across Africa.

Source: DeSIRA-LIFT; personal communication (report submitted)

Box 4

Farmer-led seed production of neglected and underutilised species

To strengthen the supply of quality seed for Neglected and Underutilised Species (NUS), CROPS4HD supports farmer-led seed production through participatory and agroecological approaches. Following Participatory Cultivar Testing (PCT) and nutritional analysis to identify the most suitable NUS crops and varieties, farmers are trained in all aspects of quality seed production—from sowing to post-harvest handling. This includes the assessment of seed quality based on farmer-defined standards (Participatory Guarantee System, PGS).

In the project regions Tanzania, Niger, Chad, and India, these efforts have enabled smallholder farmers to scale up NUS cultivation while improving seed quality and availability. The initiative integrates local knowledge exchange, farmer field schools, and train-the-trainer programmes to build both technical and organisational capacities. As a result, farmers not only meet their household seed needs but also supply local markets—contributing to food and nutrition security, climate resilience, and income generation.

Source: CROPS4HD, 2025

Box 5

Local seed businesses bridging the quality seed gap

For many crops—such as legumes, pulses, oilseeds, and vegetatively propagated crops—commercial seed production is limited. In these cases, farmers often rely on their own seed. Local Seed Businesses (LSBs) offer a viable alternative by enabling farmer-led groups to produce and distribute quality seed at the community level, improving local seed access while keeping production costs low.

ISSD programmes in Ethiopia, Uganda, and Myanmar supported the development of LSBs by partnering with entrepreneurial farmer groups and strengthening their capacity in four key areas: (i) technical production and value addition; (ii) market orientation and business viability; (iii) professional organisation and infrastructure; and (iv) strategic linkages to input suppliers, regulators, and research.

These pilots showed that with proper support, farmer groups could produce and sell high-quality seed successfully. LSBs were scaled significantly—for example, from 30 to 250 groups in Uganda—thanks to supportive policies and local government engagement. They now complement commercial seed companies by reaching underserved markets and ensuring quality seed availability across diverse agroecological zones.

Source: ISSD Ethiopia, ISSD Uganda and ISSD Myanmar; Mastenbroek et al. (2021); Borman, personal communication (paper submitted)

References and additional resources

- *CROPS4HD, 2025. Project topics – Supply.*
- *De Boef and Thijssen, 2023. Guide for designing a national seed road map.*
- *Mastenbroek et al., 2021. Institutionalising quality declared seed in Uganda.*
- *O'Connor Funk, A., 2009. The African seed company toolbox: 52 tools every seed company manager should know how to use.*
- *Wynberg, 2024. African perspectives on agroecology: Why farmer-led seed and knowledge systems matter.*

2.2. Setting goals and objectives

Ambition

The ambition for seed value addition and distribution is that seed value chains and seed markets are profitable, efficient, fair, and transparent. This seed sector function encompasses all activities between raw seed production and farmers' seed use, including seed value addition, marketing, and distribution.

The activity area further explained

Seed value addition refers to the post-harvest processes that improve the quality, appearance, and marketability of seed. These include cleaning, grading, treatment, proper packaging, labeling, and storage. Value addition improves germination rates, seed purity, and resistance to pests and diseases—ensuring farmers receive high-quality, reliable seed. It also enhances traceability, supports trust in local seed systems, and strengthens the business case for producers. For farmers, well-processed seed is more attractive, easier to handle, and aligned with their specific needs, contributing to better yields and resilience. Whether carried out by farmer-led seed enterprises or large commercial seed companies, investing in value addition consistently enhances profitability, customer satisfaction, and long-term market presence.

To be effective, seed production must be aligned with market demand. This requires producers—whether seed companies, local seed businesses, or community-based groups—to understand seed of which crops and varieties is needed, where, when, and in what quantities. Marketing and distribution plans must be integrated into production from the outset. Tools like the business model canvas help link value creation with delivery, improving efficiency, reducing waste, and ensuring seed reaches farmers on time.

Efficient seed distribution systems ensure that farmers can access quality seed of improved and preferred varieties in the right quantity and at the right time. In many countries, agro-dealer networks and local distributors remain weak or disconnected from seed producers. A lack of training, poor infrastructure, and limited quality control erode trust and limit reach. Moreover, free seed distributions or subsidies can disrupt commercial markets. Strengthening distribution requires improving agro-dealer professionalism, building decentralised seed delivery channels, and linking producers, traders, and service providers to ensure timely, affordable, and inclusive seed access.

Good practices

Promote value addition among seed producer groups

Value addition practices—such as cleaning, grading, treatment, packaging, and labeling—enhance seed quality, market appeal, and farmer trust. Supporting seed producer groups to adopt these practices boosts professionalism and competitiveness, especially in local markets (WCDI, 2020). Offering smaller, affordable seed packages with clear labeling improves accessibility for smallholder farmers. Investments in appropriate technologies, like hermetic storage or mobile threshers, reduce losses and improve shelf life. When combined with training and quality assurance, value addition strengthens farmer-led seed systems, increases adoption of improved varieties, and creates a stronger foundation for inclusive, resilient seed value chains.

Use a business planning approach to link production and sales

Linking seed production with marketing and sales strategies ensures that seed enterprises meet real farmer demand. Tools like the business model canvas help producers clarify their value proposition, identify customer segments, and align production cycles with seasonal demand (MacRobert et al., 2018). Whether used by commercial firms or farmer cooperatives, this approach strengthens strategic planning and improves decision-making around crop choices, volumes, pricing, and promotion. Embedding business planning into seed production helps minimise unsold stock, improve customer service, and build a more efficient, market-responsive seed system that delivers value to both seed producers and farmers.

Support local seed distribution networks

Decentralised distribution systems are key to ensuring seed access in remote or underserved areas. Supporting local networks—such as community-based outlets, farmer groups, and cooperatives—enables seed to reach farmers efficiently and affordably. These systems work best when integrated with advisory services, quality control, and local leadership. Training on record-keeping, customer engagement, and seed handling improves service quality and builds trust. Collaborating with NGOs, local governments, and extension agents helps scale these networks and ensure they are inclusive. Local seed distribution networks are vital for creating responsive, farmer-centered systems that complement larger commercial supply chains.

Strengthen agro-dealer networks

Agro-dealers are a critical last-mile link between seed producers and farmers. Strengthening agro-dealer networks involves building capacity in seed quality, storage, and advisory services, alongside business skills like inventory and customer management. Certified training programmes can enhance professionalism and trust, while digital tools and mobile platforms can support record-keeping and remote sales. Linking agro-dealers with seed companies and quality assurance bodies builds efficient supply chains and improves market transparency. Financial services and mentorship—especially for women and youth agro-dealers—can expand reach and resilience. Strong agro-dealer networks are essential for delivering high-quality seed at scale.

Example

Box 6

Seed fairs: Local seed distribution and community resilience

Seed fairs are community-driven events that connect farmers with a diversity of varieties, fostering knowledge exchange and preserving cultural traditions. The Seed and Knowledge Initiative (SKI) partners—organising seed fairs in Malawi, South Africa, Zambia, and Zimbabwe—showcase how these events strengthen local seed systems by featuring traditional crops, fostering farmer-to-farmer collaboration, and reaffirming community autonomy. Typically held after harvest, fairs let farmers display, exchange, or barter seeds.

Direct seed sharing helps communities recover lost varieties, adopt new practices, and bolster genetic diversity. Unlike direct seed aid, which relies on external inputs, seed fairs build local resilience through better indigenous seed access, knowledge revitalisation, and strong social ties. Coupled with cooking demonstrations or cultural festivities, fairs also renew interest in climate-resilient crops like millet or cowpeas, improving nutrition.

Local officials and researchers often attend to observe innovative approaches and celebrate farmers' achievements. Ultimately, seed fairs enhance food security, spark farmer-led innovation, and safeguard seed sovereignty, especially in fragile contexts.

Source: Seed and Knowledge Initiative; Pschorn-Strauss (2022)

Box 7

Last mile seed production and distribution in fragile contexts

Last mile seed distribution ensures smallholder farmers can easily access quality seeds near their communities, bridging the gap between formal suppliers and remote, underserved areas. The report elaborates four case studies presenting diverse, innovative strategies in fragile settings.

In South Sudan, the International Rescue Committee (IRC) engaged local farmers and refugees in local commercial seed multiplication, forming marketing associations to produce quality seed and surplus food crops. In Burundi, the IFDC partnered with seed producers and rural sales agents to popularise certified seed for example through local micro-demonstration fields. Mozambique's Green Discounts Initiative implemented by the National Cooperative Business Association CLUSA bundled seeds, fertiliser, and conservation agriculture services to reduce farmer risk while building a profitable local input chain. Niger's Girma Project implemented by Catholic Relief Services (CRS) took a market-based approach, linking local seed companies, multipliers, and agrodealers to ensure certified seed availability and sustained growth.

Source: SCALE and ISSD Africa; Mercy Corps (2022)

Box 8

Women in seed distribution – Bridging gaps and unlocking potential

Women play an essential role in seed systems—as producers, traders, and key actors in distribution—yet they often face systemic barriers. Social norms, limited access to finance, and underrepresentation in extension networks and agro-input supply chains hinder their full participation and visibility in seed distribution.

Despite these challenges, innovative models led by women—such as community-based "champion farmers"—have demonstrated success in reaching last-mile farmers with quality seed. These approaches build on trust within communities and help ensure that seed reaches diverse and often underserved users, including other women. However, women distributors need targeted support through training, access to resources, and recognition of their work.

Transforming seed distribution into an inclusive system requires integrated strategies that combine technical solutions with social change. Bundling seed delivery with advisory services, promoting gender-inclusive decision-making, and using edutainment or tailored outreach can all help shift norms and unlock women's potential in seed value chains.

Source: ISSD Africa; Kramer et al. (2023)

References and additional resources

- *Kramer et al., 2023. Gender dynamics in seed systems: What works to increase women's access to quality seed.*
- *MacRobert et al., 2018. Training manual on seed business management.*
- *Mercy Corps, 2022. Models for strengthening last mile seed production and distribution in fragile contexts.*
- *Pschorn-Strauss, 2022. The role of seed fairs in celebrating and nurturing agrobiodiversity and resilient seed systems; Case study.*
- *WCDI, 2020. Local seed business management. Module: Post-harvest value addition for SPCs working with quality seed.*

2.3. How to support seed service provision

Ambition

The ambition is that high-quality, inclusive, and differentiated services are provided to seed producers and stakeholders in seed value chains. In the seed sector, these services include plant breeding, early generation seed (EGS) production, seed quality assurance, seed extension, agro-input provision, and seed transport.

The activity area further explained

Well-functioning services are essential to ensure that seed producers can access the knowledge, inputs, and support they need to supply quality seed to farmers. Without reliable services, seed systems cannot function efficiently, adapt, or scale. However, in many countries, service provision is fragmented, underfunded, or concentrated in formal systems that may not reach small-scale or decentralised seed producers. Public services may lack resources, while private services tend to focus on more profitable segments of the market. Tailoring services to the scale, crop focus, and business model of each seed actor can address this gap. Coordination between service providers, strong public-private partnerships, and investment in capacity development are needed to ensure services are technically sound, inclusive, and sustainable. Seed sector transformation depends not just on production and distribution, but on the support systems that enable every actor in the value chain to perform effectively.

Plant breeding is the science-driven process of developing new and improved crop varieties with desirable traits such as higher yields, pest and disease resistance, drought tolerance, or improved nutritional value. It forms the foundation of any functional seed system by ensuring that varieties meet evolving farmer needs and environmental conditions. Participatory varietal selection (PVS) and participatory plant breeding (PPB) —explored further in the example below—are inclusive approaches that actively involve farmers in evaluating or co-developing varieties. These methods help ensure that new varieties align with farmers' preferences, farming systems, and market demands—leading to higher adoption rates, improved seed system responsiveness, and greater genetic diversity.

Early generation seed production involves producing high-quality input seed—commonly referred to as basic or foundation seed—that is used by seed producers to multiply certified seed for farmers. For privately bred varieties, seed companies typically manage their own EGS. However, for publicly bred varieties, EGS production often depends on public institutions, making it a frequent bottleneck in the seed value chain. This is especially true for crops like legumes and dryland cereals, where market incentives are weak. To strengthen EGS systems and reduce delivery gaps, value chain alignment, demand forecasting, pre-booking, and clear role definition are critical. Public-private partnerships and innovative business models can help ensure timely and sustainable supply (Apko et al., 2023).

Seed quality assurance ensures that seed meets defined standards for purity, germination, and health. It typically involves field inspections to verify varietal identity and purity, followed by laboratory testing for germination rate, moisture content, and physical quality. When seed meets all criteria, it is formally certified. However, full certification can be costly or impractical for small-scale producers or certain crops. Alternatives such as the Participatory Guarantee System (PGS), Quality Declared Seed (QDS) and truth-in-labelling systems offer more flexible, locally adapted models. These alternatives maintain acceptable quality standards while improving access, especially for decentralised seed systems and crops not commonly served by formal markets.

Seed extension links seed innovations with on-farm use, promoting quality seed alongside improved cultivation practices. Yet, many systems face challenges: low extension agent-to-farmer ratios, limited seed-specific training—especially for roots and tubers, and horticultural crops—and minimal private sector engagement. As a result, farmers often lack the knowledge needed to benefit from new varieties. Strengthening seed extension requires a pluralistic approach that engages both public and private actors, builds technical capacity, and integrates digital tools and farmer demonstrations. When well-coordinated, seed extension enhances variety adoption, market development, and productivity, enabling farmers to fully benefit from their investment in quality seed.

Good practices

Develop differentiated service models for inclusive support

Seed producers vary in size, crop focus, and market orientation—so service delivery must reflect that diversity. Tailored models ensure all producers can access essential services like quality assurance, EGS, supply and extension. Smallholders may benefit from simplified schemes like QDS and bundled advisory support, while larger companies need licensing, technical training, and breeder partnerships. Aligning service intensity and cost with user needs promotes sustainability, equity, and efficiency.

Establish public-private partnerships

Public-private partnerships (PPPs) leverage the strengths of both sectors to improve seed service delivery. Public institutions offer breeding capacity, regulatory authority, and infrastructure, while private actors bring agility, innovation, and local market knowledge. Effective PPPs—such as joint ventures in EGS production or seed certification—improve timeliness and reduce costs. Clear roles, shared financing mechanisms, and formal agreements ensure accountability. By aligning incentives and responsibilities, PPPs reduce reliance on donors and create more sustainable, performance-driven service ecosystems that benefit the full range of seed actors.

Embed capacity development in service delivery

Seed systems rely on skilled professionals across the value chain—breeders, inspectors, extension agents, and agro-dealers. Embedding training and mentoring into service provision ensures long-term sustainability. Support should target farmer groups, SMEs, and decentralised producers with context-specific, inclusive approaches. For example, training outgrowers on field standards and post-harvest handling improves seed quality. Capacity building should also address gender gaps and strengthen local institutions. Over time, these efforts foster innovation, increase local ownership, and reduce dependence on external technical assistance—laying the groundwork for a resilient, self-sustaining seed sector.

Enable digital tools and data systems

Digital tools enhance transparency, traceability, and efficiency in seed service delivery. Platforms like SeedTracker™ support certification, while mobile apps provide farmers with extension services, variety recommendations, and weather alerts. Demand forecasting, digital pre-orders, and mobile payments streamline planning and reduce market risk. For impact, digital inclusion must be prioritised—investing in local language content, offline functionality, and training for women and youth. When thoughtfully designed and implemented, digital systems can close service delivery gaps, support real-time decision-making, and enable more inclusive, data-driven seed sector transformation.

Example

Box 9

Decentralised, participatory plant breeding in a changing climate

Decentralised, participatory plant breeding (PPB) combines farmer collaboration with on-farm selection to tailor varieties to local agro-ecological and socio-economic conditions. By involving farmers throughout the breeding cycle—from defining traits to selecting promising lines—PPB enhances adoption, agrobiodiversity, and farmer empowerment.

PPB is particularly relevant in the context of climate change. Decentralised selection enables varieties to evolve in response to site-specific stresses, while diverse farmer preferences ensure a wide array of traits are considered. This diversity—in both space and time—builds resilience to climate variability and reduces pest and disease risks. Unlike centralised breeding, which favours uniformity and wide adaptation, PPB supports specific adaptation, making it better suited to the growing unpredictability of local climates.

In addition to its scientific rigor, PPB contributes to inclusive innovation and sustainable food systems, especially in marginal environments where conventional breeding has struggled to deliver impact.

Source: Ceccarelli and Grando (2022)

Box 10

Seed quality assurance for vegetatively propagated crops

Vegetatively propagated crops (VPCs) such as cassava, potato, and sweetpotato require seed quality assurance systems that reflect their unique biological and production characteristics. ISSD Africa-supported initiatives in Ethiopia, Nigeria, and Tanzania piloted decentralised, cost-effective seed quality assurance approaches—including field-based disease diagnostics (e.g. LAMP), digital certification platforms (e.g. SeedTracker™), and third-party inspectors. These innovations help reduce the cost and complexity of certification while improving traceability, accessibility, and compliance with quality standards.

Despite promising outcomes, challenges remain. Regulatory frameworks are often designed for grain crops and may not address VPC-specific needs. Local inspection capacity and resources are limited, and low smartphone access can hinder uptake of digital tools. Gender considerations and the capacity of producer organisations also require attention. Moving forward, aligning policy with on-the-ground realities, investing in capacity development, and fostering inclusive dialogue among stakeholders are key to scaling these solutions and ensuring farmers have timely access to healthy, high-quality planting material.

Source: ISSD Africa; McEwan et al. (2023)

Box 11

Business models for early generation seed production

ISSD Africa identified three major types of EGS business models: public sector-led, private sector-led, and joint public-private initiatives. These models differ in structure—ranging from research institutes producing breeder and foundation seed using their own resources, to private companies operating on commercial terms or through outgrower schemes. Many rely on revolving funds, seed pre-orders, or grants to ensure financial viability.

Successful models often integrate demand forecasting, formal agreements (e.g. MoUs), and incentives for contract farmers. Some grant exclusive rights to varieties, while others leverage partnerships with aggregators or grain buyers to secure seed markets. Pre-securing demand builds confidence and attracts investment—especially in semi-commercial crops like legumes and dryland cereals.

Ultimately, sustainable EGS supply hinges on strong value chain integration, enabling policies, and innovative financing. Market assurance—tying seed production to clear grain or planting material demand—emerged as a critical success factor across all models.

Source: ISSD Africa; Apko et al. (2023)

References and additional resources

- *Aguilar Gómez et al., 2023. Participatory guarantee system for the quality of farmers' seeds for community seed banks in Colombia: Methodology handbook (2nd ed., revised and expanded).*
- *Akpo et al., 2023. Accelerating early generation seed supply in sub-Saharan Africa.*
- *Ceccarelli and Grando, 2022. Return to agrobiodiversity: Participatory plant breeding.*
- *McEwan et al., 2023. Enhancing seed quality assurance: Options for vegetatively propagated crops.*

2.4. How to promote quality seed utilisation

Ambition

The ambition is to increase farmers' use of quality seed of improved and preferred varieties. The integrated seed sector and food systems model defines this seed sector function as encompassing both the promotion and use of seed. Achieving this ambition requires an understanding of what drives farmers' decisions, beyond agronomic the seed's potential alone.

The activity area further explained

Understanding seed users' preferences, customs, knowledge, and behaviours is essential to ensure that seed aligns with what farmers want. There is a critical gap: although experts—such as researchers, development practitioners, and policymakers—may know what could help farmers (i.e. what they need, such as varieties that increase yield, resist disease, or tolerate drought), they often overlook what actually motivates farmers to adopt and use these solutions. What farmers want may include traits such as taste, cooking qualities, seed color, package size, or affordability—factors shaped by personal experience, cultural context, and day-to-day priorities. To boost adoption, we also need deeper insights into how gender influences seed use and purchasing decisions.

Investing in the promotion of quality seed delivers strong returns by driving adoption and improving agricultural productivity. When farmers see tangible results—especially through demonstration plots—and receive consistent, ongoing support, their confidence in quality seed grows. Evidence shows that well-designed promotion strategies—through training, field days, media, and trusted agrodealers—significantly enhance uptake. Strategic partnerships and complementary investments further amplify impact. For promotion to be effective, it must combine multiple methods, ensuring consistent messaging and practical support tailored to farmers' real needs.

Good practices

Develop an understanding of farmers' preferences

It is important to invest in understanding what farmers truly value in seed, recognising that men and women may have different priorities. Beyond high yield and pest or disease resistance, consumption traits—such as color, taste, and cooking time—also influence purchasing decisions. Packaging size, sales location, and how information is communicated should be tailored to the diverse needs of different farmer groups. Crucially, men and women are not homogeneous categories; further segmenting the market can help seed suppliers better meet diverse preferences and increase uptake (Borman, 2023).

Invest in quality seed promotion

Promoting quality seed involves a range of strategies to raise awareness, build trust, and encourage adoption. Common approaches include demonstration plots, farmer field days, in-depth training, radio programmes, and agrodealer engagement. Demonstration sites are especially effective, allowing farmers to "see to believe" the benefits of improved varieties. Training strengthens knowledge of good agricultural practices, while radio and community events extend reach. Agrodealers are key actors in improving access and providing advice. The most effective efforts combine multiple methods, creating consistent messaging and farmer-centred support.

Support community seed banks for local seed access and agrobiodiversity conservation

Community seed banks (CSBs) are locally managed institutions that store, conserve, and distribute seeds—especially traditional and underutilised varieties. They serve as reliable, affordable sources of seed and as reserves during shocks like drought or conflict. CSBs promote agrobiodiversity, preserve farmer knowledge, and support climate resilience. They enable seed saving, exchange, and sharing, often with strong participation from women. Supporting CSBs through training, infrastructure, and links to extension services strengthens local seed autonomy, fosters innovation, and enhances the overall sustainability of decentralised seed systems.

Example

Box 12

Understanding farmers' varietal preferences in Ethiopia

Ethiopia's diverse agroecology supports a wide range of crops, but the centrally planned seed system often overlooks farmers' specific varietal preferences. A recent study involving 29,523 smallholder farmers used a citizen science approach to explore what varieties farmers prefer and why.

Through the triadic comparison of technology (tricot) design, farmers tested three randomly assigned varieties from 361 varieties across 12 crops. The findings challenge assumptions in the formal seed sector. While yield remains the top priority, adaptability and marketability also matter. Gender differences in trait preferences were clear, emphasising the need for gender-sensitive approaches.

Although newer varieties were generally favoured, farmers still valued diversity and often preferred a mix of traits over a single "best" variety. These insights underline the importance of involving farmers in variety development, release, and delivery. By recognising farmers' voices, seed sector actors can better meet farmer needs and enhance sustainability and food security.

Source: ISSD Ethiopia; Borman, personal communication (paper submitted)

Box 13

Promotion of quality seed and good horticulture practices in northern Uganda

Training on good agricultural practices in northern Uganda has significantly increased the use of quality vegetable seed. A collaboration between ISSD Plus and East-West Seed delivered in-depth, field-based training and live demonstration plots, allowing farmers to see tangible results and build trust in improved varieties. Key training topics included seedling production, fertilisation, crop protection, and soil moisture conservation—practical and affordable methods adapted to local conditions.

Farmers were more likely to adopt quality seed when they saw clear yield and profit gains, even on small plots. Ongoing support from knowledge transfer officers and communication via radio and community gatherings reinforced learning. The programme also helped reduce fears of counterfeit seed and encouraged buying from trusted agro-input dealers. By connecting training to farmers' practical priorities and market opportunities, the programme showed that hands-on learning is essential for sustainable quality seed adoption.

Source: ISSD Africa; Guijt and Reuver (2019)

Box 14

Enhancing the sustainability of community seed banks

Community seed banks (CSBs) are farmer-led institutions that conserve crop and tree diversity and strengthen seed security. However, they face challenges in long-term sustainability. Research by the Bioversity-CIAT Alliance and partners across India, Nepal, Kenya, and Uganda identified five promising strategies to improve CSB sustainability: (i) value addition and income generation; (ii) nature-positive agriculture; (iii) networking and digital tools; (iv) partnerships with national genebanks; and (v) low-cost seed quality management technologies.

These strategies build CSBs' environmental, financial, and institutional resilience. Income-generating activities (e.g., seed processing or crop-based products) improve financial viability. Nature-positive practices sustain biodiversity, while digital platforms and networks enhance collaboration and access to knowledge. Stronger ties with national genebanks aid conservation, and affordable technologies raise seed quality standards.

With ongoing capacity building, policy support, and collaboration, CSBs can become key players in agrobiodiversity conservation and resilient food systems.

Source: Vernooy et al. (2024)

References and additional resources

- *Borman, 2023. Having skin in the game: Creating demand for quality seed.*
- *Guijt and Reuver, 2019. Sowing the seed: Adoption processes of good horticulture practices in northern Uganda.*
- *Vernooy et al., 2024. Promising strategies to enhance the sustainability of community seed banks.*

2.5. How to strengthen seed stakeholder organisation

Ambition

The ambition is that seed sector stakeholders are well-organised across the full range of operations and services within the seed value chain. This includes organisation around seed production (e.g. cooperatives and federations), seed marketing and trade (e.g. associations and networks), value chain partnerships (e.g. contract farming and outgrower schemes), and service delivery (e.g. seed testing laboratories and service centres).

The activity area further explained

Organising seed stakeholders strengthens their ability to access critical resources—such as early generation seed, quality assurance services, finance, and markets— while also fostering inclusiveness, individual empowerment, and collective agency. Strong organisations give stakeholders a platform to engage in dialogue, influence decision-making, and coordinate efforts. Examples include farmer seed producer organisations that collectively manage production and marketing, national seed associations that represent a diversity of seed entrepreneurs, and value chain partnerships that integrate seed within broader production and procurement arrangements. Strengthened stakeholder organisation is foundational to a resilient, equitable, and efficient seed sector.

Organising farmer seed producers into cooperatives or structured groups significantly enhances their capacity to produce and market quality seed. While individual farmers often face constraints in accessing inputs, training, and markets, collective organisation allows them to pool resources, coordinate production, and improve bargaining power. Through such groups, farmers can access foundation seed, benefit from technical guidance, comply with quality standards, and link to buyers more efficiently. Organised structures also facilitate engagement with government agencies and support services, which are often difficult to reach for individuals. By strengthening farmer agency and improving service delivery, these groups contribute to closing the seed supply gap, supporting varietal diversity, and fostering resilient, inclusive seed systems that work for both commercial and local crop types.

Seed trade associations are essential for organising and amplifying the voice of seed sector actors, particularly within the private sector. They serve as platforms for dialogue, coordination, and advocacy, helping members engage with policymakers, regulatory bodies, and development partners. By uniting diverse seed enterprises—including seed companies, producers, agro-dealers, and traders—associations foster a more inclusive and coherent seed sector. Their roles may include promoting ethical business practices, influencing policy reform, and facilitating capacity building or market access. A strong, representative association contributes to a better business environment, improves service delivery, and enhances the sector's credibility. When well-functioning, seed associations also help align the interests of domestic and international actors and can play a catalytic role in regional harmonisation efforts and cross-border seed trade.

Good practices

Build capacity and structure in farmer seed producer organisations

Farmer seed producer organisations can play a central role in local seed systems—but only if they are well-structured and well-supported. Beyond formal registration, they need capacity building in seed production, quality control, cooperative governance, and financial management. Clear bylaws and accountable leadership build internal trust, while partnerships with research institutes, seed agencies, and NGOs improve access to early generation seed, extension, and finance. When professionalised, these organisations become reliable actors in the seed value chain, improving seed availability and farmer incomes.

Enhance representation and services in national seed associations

National seed associations are key platforms for advocacy, coordination, and capacity building. To serve the full sector, they must represent a diverse membership—across regions, crop types, and business models—through inclusive governance structures. A strong value proposition attracts members and drives engagement. Services may include training, policy advocacy, networking, and market information. Participatory leadership and transparent operations build legitimacy. Well-functioning associations amplify the voice of domestic seed actors, facilitate dialogue with government, and support policy reform—helping align public and private interests for a stronger, more coherent seed sector.

Example

Box 15

Organising farmer seed producers – Potential of the FARE approach

Organising farmers is critical for strengthening their role in seed systems—especially for those involved in seed production. The Farmer Agency for Rural Economies (FARE) approach, developed by WUR and partners, focuses on building collective entrepreneurship through inclusive, locally embedded support systems.

While the FARE approach has been successfully applied in other agricultural sectors—such as sugarcane and maize—it shows strong potential to support farmer seed producers as well. In these examples, farmer cooperatives gained greater market access, improved service delivery, and enhanced relationships with buyers and financial institutions.

For seed producers, similar organisation could lead to better quality assurance, coordinated production planning, and stronger negotiation power. By strengthening collective structures, the FARE approach offers a pathway for smallholder seed producers to become more professional, visible, and viable actors in local and national seed systems.

Source: WUR (2024)

Box 16

Organising farmers to improve seed and commodity production

The Markets and Seeds Access Project (MASAP) in Zambia and Zimbabwe has shown how organising farmers can strengthen both seed and commodity production systems. The project worked through farmer production groups and Community-Owned Enterprises (COEs), supporting over 30 inclusive business models that reached nearly 32,000 smallholder farmers—many of whom were women and youth.

By partnering with local seed companies, NGOs, and research institutes, MASAP supported the formation and training of seed producer groups, improved access to quality seed, and promoted contract farming arrangements. Organised groups were also linked to reliable markets, enabling farmers to aggregate demand, improve bargaining power, and adopt improved crop varieties more easily.

Through its Innovation Fund, MASAP co-financed equipment and enterprise initiatives, empowering groups to engage in value addition and business development. These collective structures increased incomes and resilience, particularly in underserved areas, and offer a scalable model for empowering smallholder farmers—especially women and youth—in seed and broader agricultural value chains.

Source: MASAP; Project annual report 2023

Box 17

Revitalising Kenya's seed trade association

The Seed Trade Association of Kenya (STAK) provides a compelling example of how targeted support and internal reform can transform a national seed association into a high-impact industry voice. In the early 2010s, STAK struggled with declining membership, weak governance, and limited advocacy capacity. Through renewed private sector leadership and strategic donor engagement, STAK undertook a series of reforms—revising its constitution, improving governance, professionalising its secretariat, and rebranding its services.

Key outcomes included stronger representation in policy processes, successful lobbying for regulatory changes (such as label cost reductions), and improved member engagement. STAK expanded its member base, introduced subcommittees to address advocacy, finance, and marketing, and enhanced its digital platforms. The association also built partnerships with agrodealers and hosted industry-wide events that added value for members. STAK's turnaround illustrates how national seed associations can strengthen their legitimacy, services, and influence—provided they invest in internal capacity and responsiveness to member needs.

Source: Agri Experience (2018)

References and additional resources

- *Agri Experience, 2018. Case Study: Strengthening a seed trade association in Kenya.*
- *ISSD Uganda, 2015. Supporting local seed businesses; A training manual for ISSD Uganda.*
- *MASAP, 2023. Empowering Smallholder Farmers in Zambia and Zimbabwe. Markets and Seed Access Project.*
- *WUR, 2024. Farmer Agency for Rural Economies Guide. Introducing FARE (part 1): From dependency to farmer agency.*

2.6. How to improve seed sector regulation

Ambition

The ambition is that clear and effective rules and systems are in place to govern seed production, marketing, service provision, sector coordination, and seed use.

The activity area further explained

Seed policy and regulatory frameworks are essential for shaping farmers' access to quality seed of improved and adapted varieties. They determine which varieties reach the market, who may produce and sell seed, what quality standards apply, and where seed can be sold. A national seed policy outlines the government's vision, objectives, and strategic direction for the seed sector within the broader agricultural context. It defines guiding principles, institutional arrangements, and stakeholder roles while reflecting on international agreements and recognising diverse seed systems (FAO, 2015).

Complementing the seed policy, a seed law establishes specific rules, standards, and enforcement mechanisms. It enables implementation by formal institutions and supports regulatory coherence. Together, policies, laws, regulations, and guidelines form a comprehensive framework that impacts the functionality, inclusivity, and sustainability of a country's seed sector. Find below a number of key regulatory components shortly explained (based on FAO, 2018). Together, these components ensure that regulation supports innovation, safeguards quality, and balances the needs of diverse seed actors.

Registration of seed entities: Registration enables government oversight of individuals and organisations involved in seed production and sales, allowing for compliance monitoring and enforcement. While registration is typically required for commercial seed companies, decisions must be made on whether traders, cooperatives, or community-based seed producer groups should also register.

Variety testing and release: Only improved crop varieties that outperform existing ones should enter the market. These varieties undergo Distinctness, Uniformity, and Stability (DUS) testing, and are further evaluated for Value for Cultivation and Use (VCU) under local conditions. Approved varieties are listed in the national variety catalogue. Increasingly, separate provisions are made to register farmers' varieties under adapted standards that value genetic diversity over uniformity.

Seed quality assurance: Quality assurance includes two main steps: (i) field inspection to verify varietal identity and purity, and (ii) laboratory testing for germination, purity, moisture content, and seed health. Certification can be mandatory or voluntary. Alternative systems like Quality Declared Seed (QDS) and truth-in-labelling offer more flexible options. All marketed seed must be accurately labeled with key quality details.

Seed import and export: Seed movement across borders must comply with phytosanitary standards to prevent the spread of pests and diseases. Import permits and phytosanitary certificates (under the IPPC) are generally required. Imported seed must meet national quality standards and may need to be listed in the national variety catalogue. Streamlined procedures and coordination among seed and plant health authorities are crucial for efficiency.

Plant Variety Protection and Farmers' Rights: Plant Variety Protection (PVP) gives breeders exclusive commercial rights over new varieties, encouraging innovation and investment. However, PVP must be balanced with Farmers' Rights under the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Farmers should retain the right to save, reuse, exchange, and sell seed, particularly for non-commercial use. Regulatory frameworks should recognise farmer-bred varieties and ensure these systems coexist to support both innovation and agrobiodiversity.

Good practices

Formulate policy fostering a pluralistic seed sector
Seed policies should promote the development of diverse seed systems, recognising their complementary roles in improving seed access (CROP-S4HD, 2023). Alongside support for commercial seed systems, policies must acknowledge the importance of farmer-managed systems, especially for less commercial crops. Tailored regulatory options should be provided for different systems, yet many current policies remain overly focused on private sector models. Greater policy support is needed for smallholder and community-based approaches (Vernooy et al., 2023).

Facilitate an inclusive policy formulation process
Policies are only effective when stakeholders see their value and feel ownership. Therefore, policy processes must actively involve all seed system actors, including regulators, private sector, farmers, and civil society. Consultative processes build trust and lead to balanced, inclusive outcomes. In practice, however, farmers are often excluded from formal decision-making structures, such as national seed boards, limiting the relevance and legitimacy of seed policies (Spielman, 2020).

Elaborate options rather than enforcing one standard

Regulatory frameworks should offer flexibility rather than enforce uniform standards across all seed systems. For example, seed certification is suitable for commercial crops like hybrid maize but less so for crops produced in dispersed, community-based systems. Options like QDS can coexist with formal certification. Flexibility should extend to producer registration, variety release, and PVP, but this is only possible if such alternatives are formally recognised in policy and law (Kuhlmann and Dey, 2021).

Strengthen capacity for implementation of regulations

A sound regulatory framework is only effective if it is implemented. Many countries face challenges due to underfunded regulatory bodies, limited human capacity, and outdated infrastructure. Paper-based systems slow down procedures. Investments are needed in training, digitisation, and facilities like seed labs. Without these, even well-designed laws and policies will fall short of delivering results.

Example

Box 18

Developing Uganda's pluralistic national seed policy

Uganda's initial draft National Seed Policy prioritised a private-sector-led seed industry, largely overlooking the role of smallholder farmers and the crops they depend on. However, pilot initiatives by ISSD Uganda demonstrated that farmer groups could successfully produce and market quality seed, sparking a shift toward a more inclusive policy approach.

A coalition of programmes—ISSD Uganda (led by WUR), PASIC (led by IITA), and USAID's Enabling Environment for Agriculture project—facilitated stakeholder consultations at national, zonal, and district levels. These revealed differing perspectives: private companies emphasised market competitiveness, government actors leaned toward formal systems, while farmers and local governments advocated for broader recognition.

Through open dialogue and negotiation during national workshops, stakeholders reached consensus. The revised policy, approved in 2018, formally adopted a pluralistic vision for the seed sector. It explicitly acknowledges the value of farmer-managed seed systems and formally recognises Quality Declared Seed (QDS) as a distinct and legitimate seed class.

Source: ISSD Uganda; Mastenbroek et al. (2021); Personal communication (paper submitted)

Box 19

Seed law harmonisation and the importance of farmer inclusion

Seed law harmonisation involves aligning national seed regulations across countries to enable smoother cross-border seed trade, improve regional seed availability, and promote food security. In Africa, regional blocs such as ECOWAS, SADC, and COMESA are leading efforts to harmonise seed laws by developing common standards for variety registration, seed certification, and phytosanitary measures.

While these efforts reduce trade barriers and benefit commercial seed companies, they often overlook the diverse realities of smallholder farmers. Harmonised frameworks may unintentionally restrict traditional practices such as saving, using, and exchanging seed—key components of farmer-managed systems. Treaties like the Arusha Protocol seek to safeguard Farmers' Rights, but implementation and farmer participation remain weak.

To ensure harmonised laws are inclusive and equitable, it is essential that farmers and their representatives are meaningfully involved in policy development. Doing so ensures laws reflect local needs, protect agrobiodiversity, and support seed systems' resilience at all levels.

Source: DeSIRA-LIFT; Munyi (2022)

Box 20

Registration of farmers' varieties in Nepal

In 2021, six landraces—representing proso millet, foxtail millet, finger millet, amaranth, and common bean—were officially registered in Nepal, marking a significant milestone in recognising farmers' varieties within the formal seed system. Approved under the flexible provisions of Schedule D in the Seed Regulation (2013), these varieties were developed through generations of traditional selection and local knowledge.

Formal registration grants these crops legal status, strengthens their conservation, and enables farmers to benefit from their commercialisation. It also helps protect them from biopiracy and marginalisation. Community seed banks and cooperatives played a critical role in maintaining source seed and ensuring varietal integrity throughout the process.

Nepal's approach offers a model for integrating farmer-led innovation into national seed systems. It illustrates how inclusive regulation can support agrobiodiversity, strengthen local economies, and increase farmers' autonomy in managing and marketing their own genetic resources.

Source: Nepal Seed System Project (DADS II); Pudasaini (2021)

References and additional resources

- *CROPS4HD, 2023. Position paper on policies for pluralistic seed systems.*
- *FAO, 2015. Voluntary guide for national seed policy formulation.*
- *FAO, 2018. Seeds Toolkit. Module 4: seed regulatory framework.*
- *Kuhlmann and Dey, 2021. Using regulatory flexibility to address market informality in seed systems: A global study.*
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- *Munyi, 2022. Current developments in seed laws harmonisation in Africa.*
- *Pudasaini, 2021. Six farmer's varieties of neglected and underutilised crop species officially registered in Nepal.*
- *Spielman, 2020. Seed policies and regulatory reforms.*
- *Vernooy et al., 2023. Policies, laws and regulations in support of farmer-managed seed systems: still a long way to go. A review of 14 countries in Africa.*

2.7. How to foster seed sector coordination

Ambition

The ambition of this seed sector function is to establish appropriate governance and coordination mechanisms that foster alignment and accountability among seed sector stakeholders.

The activity area further explained

Effective seed sector coordination ensures that all actors along the value chain work together under a structured and institutionalised framework. A dedicated coordinating body—such as a government agency, association, or council—plays a central role in overseeing strategic issues including policies, regulations, and investment decisions, while ensuring that roles, responsibilities, and accountability mechanisms are clearly defined.

To achieve the ambition, a well-functioning seed sector requires a national coordinating body that is embedded within government structures and supported by a capable secretariat to manage daily operations. Regional coordination structures should align with national mechanisms and ensure inclusive representation. Transparent information sharing, open dialogue, and a robust monitoring and evaluation system are essential to track sector performance and strengthen governance.

While some countries choose to embed seed sector coordination within broader agricultural platforms, maintaining a dedicated seed focus is critical. It ensures that specific institutional, technical, and strategic challenges unique to seed systems receive the necessary attention. Strong leadership, a shared vision, and collaboration among all value chain actors are key to building a resilient and sustainable seed sector.

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Good practices

Develop a national seed sector strategy or seed road map

A national seed strategy or road map helps guide coordinated seed sector transformation. Grounded in system assessments and stakeholder consultation, it outlines key challenges, sets clear goals, and identifies innovation pathways. The process promotes systems thinking and aligns formal and informal seed systems with broader food system goals. When backed by strong ownership and implementation plans, a seed road map serves as a practical tool to align actors, attract investment, and monitor progress—ensuring seed system improvements are strategic, inclusive, and results-oriented (De Boef and Thijssen, 2023).

Seek alignment of donor investments

Donors often support seed sector development directly—by addressing seed system challenges—or indirectly—by supporting crop value chains, agribusiness, or rural development. To maximise impact, their efforts should align with national strategies like a seed road map. Platforms such as agricultural donor working groups offer opportunities to coordinate funding, avoid duplication, and strengthen complementarities. Regular coordination, shared learning, and transparency help build collective impact and ensure that donor efforts contribute meaningfully to long-term seed sector transformation. Alignment also increases efficiency, supports national ownership, and improves accountability to both local stakeholders and global development goals.

Create space for seed sector stakeholders to share and learn

Dedicated spaces for learning and collaboration help build trust and drive innovation. Multistakeholder platforms at national or regional levels bring together government, private sector, researchers, and civil society to identify challenges and co-create solutions. These platforms foster inclusive dialogue, evidence-based decision-making, and joint ownership of reforms. With clear mandates, good governance, and skilled facilitation, they can support coordination, scale innovations, and strengthen accountability across the seed sector (Mulkerrins and Thijssen, 2025). Ongoing engagement helps align diverse interests and keeps momentum behind shared priorities.

Example

Box 21

Development of a national seed road map for Nigeria

The National Seed Road Map (NSRM) for Nigeria is a strategic document endorsed by the National Agricultural Seeds Council (NASC), the country's lead agency for seed sector coordination and regulation. It was developed through an inclusive, participatory process that brought together a wide range of stakeholders, including government bodies, seed companies, research institutes, NGOs, and farmer organisations.

The NSRM aims to transform Nigeria's seed sector by increasing farmers' access to and use of quality seed of improved and preferred varieties. It addresses the root causes of low adoption rates and the significant gap between seed supply and demand. Through tackling institutional, technical, and structural constraints, it envisions a more efficient, equitable, and market-driven seed sector.

The roadmap outlines achievements and challenges and presents 22 strategic innovation pathways organised around six core seed sector functions. Using a systems thinking approach, it emphasises public-private collaboration, decentralisation, support for diverse seed systems, and improved governance. The NSRM serves as a guiding document for coordinated action, policy alignment, and investment in a resilient, inclusive, and high-performing seed sector.

Source: NASC and SEEDAN (2020)

Box 22

Monitoring progress – The Nigerian seed sector dashboard

To track implementation of the NSRM, Nigeria developed a comprehensive Seed Sector Dashboard. This tool provides a structured, data-driven overview of progress across 22 strategic topics grouped under key seed sector functions such as service provision, production, market development, and governance. Each topic is linked to NSRM ambitions and assessed annually by national experts using standardised, weighted indicators.

The dashboard enables stakeholders to monitor achievements, identify gaps, and assess overall sector performance. It fosters transparency, accountability, and coordination across government, private sector, and development partners. By visualising progress, it supports evidence-based decision-making and strategic alignment.

Regular updates and validation through the national seed platform ensure that the dashboard remains relevant and inclusive. It serves as a critical mechanism to turn strategy into action—guiding investments, informing policy, and reinforcing shared commitment to sector transformation. Measuring progress is essential to staying on course and delivering meaningful, long-term impact.

Source: Collaborative Seed Programme Nigeria; NASC (2023)

Box 23

Seed sector coordination and innovation through regional seed core groups in Ethiopia

To address persistent seed sector challenges that could not be solved locally, Ethiopia established Regional Seed Core Groups (RSCGs) across four regional states. Endorsed by the Bureaus of Agriculture, these groups brought together around 12 key decision-makers from government, research, civil society, and the private sector. Their aim was to foster systemic change through inclusive dialogue, contestation, and joint problem-solving.

RSCGs piloted innovations, generated evidence, and shaped reforms—such as the introduction of direct seed marketing and establishment of independent seed regulatory authorities. With structured governance, quarterly meetings, and clear mandates, the groups developed regional strategies aligned with national priorities and supported scaling through annual workshops.

Though some RSCGs have become inactive, their impact demonstrates how inclusive, well-facilitated regional platforms can influence seed governance and innovation, even within hierarchical systems. The model offers valuable lessons in decentralised coordination, trust-building, and collaborative action in seed sector development.

Source: ISSD Ethiopia; Mulkerrins and Thijssen (2025)

References and additional resources

- *African Union Commission, AGRA and TASAI, 2024. Seed sector performance index – 2023 status report for Africa.*
- *De Boef and Thijssen, 2023. Guide for designing a national seed road map.*
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2.8. How to generate seed sector funding

Ambition

The ambition is that the seed sector has the capacity to generate revenues and make strategic reinvestments. This sector function refers to the process by which fiscal mechanisms or non-state bodies collect revenue—through taxes, duties, levies, and fees—and reinvest it into the sector via subsidies, funds, and other support measures.

The activity area further explained

The core idea is to capture a portion of the value generated by the sector and allocate it to strategic, pre-competitive investments in research, education, development, regulation, and governance. This, in turn, enhances the sector's attractiveness to private investors, financial institutions, and donors. While such mechanisms are used in certain commodity value chains, such as coffee and tea (Molenaar et al., 2017); similar practices in the seed sector remain rare.

In many countries, there is a weak or missing financial link between the delivery of seed sector services and the revenues collected to support them. Some services, such as farmer extension or advisory support, are often provided free of charge. Others—such as seed quality assurance (including field inspection, laboratory testing, and accreditation)—require payment. However, even when fees are collected, they are frequently absorbed into national treasuries rather than reinvested into the services themselves, limiting the ability to improve or expand service delivery.

Access to finance for the agricultural sector—including credit, insurance, and tailored financial services—remains a challenge, and the seed sector is no exception. Even when financial institutions are involved in agriculture, they often lack a clear understanding of the specific business models and needs of seed enterprises and farmer-led seed producer groups. For example, seed is frequently not accepted as collateral, and financing instruments are rarely designed to reflect the production cycles or risks of seed businesses. As a result, both commercial and farmer-led seed enterprises struggle to access credit and investment. Advocacy and collaboration among governments, banks, and development finance institutions are needed to recognise the seed sector's potential and co-develop targeted financing tools.

Good practices

Establish sustainable funding mechanisms for seed services

Linking service fees directly to delivery improves performance, accountability, and sustainability. In many countries, fees paid by seed companies are absorbed into general budgets and not reinvested in the seed sector. As a result, key services—like certification or inspection—remain underfunded, leading to inefficiencies and delays. Allowing service providers to retain revenue and manage operational budgets enables more timely, reliable service delivery. Transparent systems, coupled with provider autonomy, help build trust, ensure reinvestment, and reduce dependence on donor funding—especially in growing or decentralised seed systems.

Develop financial products and services tailored to seed business

Tailored financial services are essential for supporting seed enterprises. This starts with assessing seed business models and identifying specific credit and investment needs. Seed producers require strong governance, transparent accounting, and legal compliance to become investment-ready. At the same time, banks and financial institutions need training in seed systems and risk profiling. Advocacy with governments, central banks, and development finance institutions can unlock support. Collaborative pilots—like value chain-integrated credit, warehouse receipt systems, or guarantee-backed loans—can address cash flow gaps and attract broader financial inclusion into the seed sector.


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Example

Box 24

Exploring financing models for seed business development

Access to finance remains a major bottleneck for emerging seed enterprises, especially in sub-Saharan Africa. A study by ISSD Africa identified multiple financing models that, when tailored to seed sector needs, can unlock business growth and professionalisation. These include value chain finance—where seed companies provide inputs or cash to contracted out-growers, repaid through harvest sales—and inventory credit systems, which allow seed producers to store seed as collateral and delay sales until market prices improve.

Group-based savings and credit schemes (e.g. VSLAs, SACCOs) and the "seed box" approach have also proven effective in supporting working capital for local seed businesses. In some cases, loan guarantee funds—offered by development partners—bridge trust gaps between banks and seed producers, easing access to commercial loans. Meanwhile, targeted start-up grants, like those from AGRA, have catalysed growth for seed companies by enabling early investment in infrastructure and market entry.

While no single mechanism fits all, blended approaches combining grants, savings, guarantees, and tailored loans show strong potential for building financially sustainable seed enterprises across diverse contexts.

Source: ISSD Africa; Minneboo et al. (2017)

References and additional resources

- *Dokle and Farrell, 2012. Mobilising agricultural finance; Toward a common language between lenders and agri-SMEs in sub-Saharan Africa.*
- *Minneboo et al., 2017. Financing seed business.*
- *Molenaar et al., 2017. An overview of sector governance; Looking beyond the value chain to build high performing and resilient agriculture sectors.*

3

How to address seed insecurity in fragile contexts

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The previous section has discussed the dynamics and functions of seed sectors which operate in more or less stable and secure countries and food systems. There is minimum urgent threat to the basic functioning of the sector and the provision of seed; it is rather about developing or transforming the current system.

Yet in food systems which are affected by fragility, human-made and natural disasters, or protracted crises including conflicts and severe climate stresses, seed sectors regularly struggle to sustain performance to a level that meets the needs of stakeholders. In such cases, critical challenges can cause multiple sector functions to be disrupted or to collapse entirely, seriously constraining seed availability and access. In these contexts, the main focus area is ensuring seed security.

A different playing field on seed security

Seed security responses see different types of actors with separate priorities engaging in different forms of responses. Humanitarian organisations strive to meet immediate needs, often following an emergency; development practitioners focus on strengthening resilience and food security; and in times of conflict, peace-building actors focus on the causes of conflict and improving social cohesion amongst divergent groups.

Commonly however, external interventions by development and humanitarian agencies are not complementary and are sometimes designed with contradictory objectives. Consequently, they do not always sustainably respond to farmer and community needs or interests. Humanitarian interventions often weaken seed sectors in the long-term through the displacement of private sector actors, market flooding of inexpensive or free seeds, or bulk purchases of crops or seeds not suitable for the climate or environment. Seed sector development programmes for their part, are rarely designed to continue operations during emergencies and are comparatively inflexible to adapt to pressing urgent realities and needs.

What is seed (in)security

Seed security exists when men and women within the household have sufficient access to adequate quantities of good quality seed and planting materials of preferred crop varieties at all times, in both good and bad cropping seasons (FAO, 2016). There are four components that constitute seed security:

1. **Seed availability:** There is a supply of seed that can be acquired;
2. **Seed access:** There are ways for seed to be sold, traded, loaned, distributed, or gifted;
3. **Varietal suitability:** The seed is of varieties that the farmer prefers, is suited to local agro-ecology, and that the farmer knows how to cultivate;
4. **Seed quality:** The health and attributes of the actual seed are good

The inverse of seed security is seed insecurity. Seed insecurity exists when any of these four components are not present, whereas resilience in seed security terms is demonstrated when post-shock seed security remains steady, according to the four components (FAO, 2016). It is important to note that attaining seed security does not mean farmers themselves have to produce all the seed they need. Rather, it means diverse groups of farmers should be able to access seed of suitable varieties on a regular, predictable basis (Sperling et al., 2022b).

Acute seed insecurity

Acute seed insecurity is caused by short-term events that impact a wide population, such as a failed planting season, lost harvest, or seed infestation. It can affect any household, even those normally seed secure, during events like floods or civil disturbances. Farmers who recover quickly, with or without seed aid, usually face only acute stress. Note that food stress doesn't always lead to seed stress, and seed systems, especially for crops like sorghum, can be resilient enough to meet farmers' needs (Sperling et al., 2006)

Chronic seed insecurity

Chronic seed insecurity occurs independently of acute events but can be worsened by them. It affects marginalised populations, such as the poor, those in drought-prone or degraded areas, or those in politically unstable regions. These populations face continual seed shortages, struggle to buy seed, and often use poor-quality or unwanted varieties, leading to long-term vulnerability to seed system crises (Sperling et al., 2006).

How does conflict affect seed sectors

Conflict disrupts both the demand for and supply of seeds, potentially leading to chronic seed insecurity. Conflict can significantly disrupt seed sector functions, with effects varying based on the conflict's nature, intensity, and duration. In conflict-affected regions, the formal seed system—often reliant on government services or commercial supply chains—tends to collapse or become severely weakened.

This has a direct impact on the availability of high-quality seeds, which are usually produced by commercial seed companies. Conversely, informal seed systems, which are more localised and farmer-driven, can sometimes continue operating to a certain degree, ensuring the availability of certain seeds such as beans and small grain cereals like millet and sorghum.

Conflict also forces changes in agricultural practices. For example, farmers may alter the types of crops they plant based on factors such as security, labour availability, and access to markets. This could involve switching to crops that are more resistant to theft or those that take longer to harvest, providing farmers more time to move them to safer areas. Furthermore, displacement due to violence can change farming locations, leading to shifts in crop choices or the necessity of new farming techniques.

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How to respond to seed insecurity

Whether or not a household or community is considered seed secure or insecure is the central question that underpins humanitarian seed responses, framed as seed security programmes. Seed security programmes may have diverse goals including focusing on staple crop food production, focusing more on nutrition provision than just calories, focusing more on climate-resilient crops and varieties, or focusing on higher-value crops for local markets. Each goal will need a different strategy for humanitarian actors and other stakeholders.

Base decisions on good quality assessments

The specific strategy for seed security programmes is best underpinned by some form of assessment, commonly being a Seed Security Assessment (SSA, also known as Seed System Security Assessment, SSSA). An SSA has two fundamental objectives: (i) to get a clear understanding of the challenges that are impacting seed security; and (ii) to inform decision-making on the most suitable type of response, given the context.

SSAs are designed not just to be used directly after shocks and acute emergencies, but also to understand chronic seed insecurity and help donors and organisations frame longer term strategies. The SSA process sees triangulated data from a number of different sources including household surveys, local market surveys, focus group discussions, key informant interviews and tailored questionnaires for different types of seed sector actors. Good quality SSAs prioritise active participation of and feedback to stakeholders, are conducted and analysed rigorously, deliver actionable, practical recommendations and are supported with additional resources and tools (FAO, 2016).

Within the domain of humanitarian seed responses, there is increasing pressure from donor agencies for SSAs to be conducted before seed aid is approved. Yet there remain many examples where responses are decided upon without the completion of a thorough SSA beforehand.

Prioritise market-based responses to seed insecurity

Good quality assessments will yield valuable information on which response type is necessary and preferable. Market-based approaches are increasingly prioritised in seed insecurity responses, focusing on strengthening local markets rather than relying on free seed distribution. While Direct Seed Distribution (DSD), or 'seed aid,' has been the traditional response, it often undermines local seed markets by introducing non-local varieties and disrupting market dynamics. DSD can be logistically complex, and although it can quickly reach large numbers, it is not always timely or suitable for local conditions.

In contrast, market-based approaches support the resilience of local seed markets by promoting access to diverse planting materials and injecting funds into the local economy. These approaches help maintain functioning markets during crises, as local markets tend to be more resilient and adaptable. They also ensure that seed systems, both formal and informal, continue to function over the long term, preserving market integrity and preventing the dependency on external aid. This shift reflects the growing recognition that local actors are often the quickest to adapt and respond to challenges.

There are many examples of market-based approaches to seed security. Each shares the goal to stimulate connection between local purchasers and suppliers of seed. Three of the more common examples of market-based approaches are:

1. **Cash transfers:** Direct cash transfers to farmers, enabling them to purchase seed and other necessary supplies from local markets. This approach boosts the local economy and provides farmers with the flexibility to make decisions based on their specific needs. In recent years, cash transfers have also been facilitated digitally, reducing the risks associated with larger amounts of cash.

2. **Vouchers:** Seed vouchers (either physical or digital) allow farmers to purchase seed from both formal and informal suppliers. This system gives farmers greater choice while supporting local businesses and ensuring that seed markets remain functional. Digital innovations are also used in voucher provision as they can help to prevent fraud, theft and associated risks.

3. **Seed fairs:** These fairs provide an opportunity for farmers to buy seeds from a variety of suppliers, often combined with vouchers. Seed fairs promote diversity in seed options and stimulate local economies by injecting funds into the community.

Seek alignment between humanitarian, development and peacebuilding partners towards a HDP-Nexus

There is now increased focus and attention from humanitarian and development organisations to better align their work in support of seed security and seed sector resilience, under a Humanitarian, Development and Peacebuilding Nexus (HDP-Nexus). The aim is to share on and better understand the rationale and benefit of specific responses, to enable joint strategy development and to ensure efficient coordination and alignment across activities and outcomes.

Key tenants of this work are around the complementary support and promotion of market-based approaches for sector resilience, deepening the support to and integration of community seed producers and organisations into emergency response strategies, and developing a repertoire of methodological support tools and guidance to support structured and informed responses. Achieving an effective HDP-Nexus calls on food system initiatives and partners to be proactive and transparent in their outreach and willingness to engage, inform and align on activities.

Good practices

Multiple partners engaged in seed security interventions have jointly reflected on their collective experiences and put forward the 10 Guiding Principles of Good Seed Aid. The '10Ps' aim to guide effective seed security responses in emergencies, ensuring sustainable and targeted assistance.

The 10 Principles are supported by specific Technical Notes to guide the adoption and implementation of the principle (SeedSystem and Mercy Corps, 2024). For short reference, the 10 Principles are:

1. Seed System Security Assessment (SSSA)
Conduct assessments to identify seed security problems among diverse groups, focusing on availability, access, seed health, and variety suitability.

2. Response type
Choose the appropriate response (e.g., direct distribution, cash, or voucher-based interventions) based on the specific seed security problem identified.

3. Goal of the intervention
Design the intervention with clear, farmer-driven goals, ensuring that the assistance addresses both immediate needs and long-term resilience.

4. Context
Match the response to the local context, considering social, environmental, and gender factors while ensuring that the intervention adheres to the "do no harm" principle.

5. Timeliness
Ensure seed is delivered in time for farmers to plant according to their normal sowing cycles, avoiding delays that compromise productivity.

6. Market-based assistance
Prioritise market-based approaches to support seed security, facilitating both demand-side (farmer purchasing power) and supply-side (seed vendors) interventions.

7. Crop and variety choice
Select crops and varieties that suit the local context, farmer preferences, and agricultural conditions, considering gendered needs and stress tolerance.

8. Seed quality
Maintain seed quality to meet minimum standards, ensuring reliable production and avoiding the spread of diseases or pests through proper seed handling.

9. Farmers' choice
Provide farmers with a choice of seeds, offering a variety of crops and varieties to cater to different household needs and farming strategies.

10. Feedback at multiple key stages
Integrate monitoring and evaluation processes throughout the intervention, collecting feedback from farmers and suppliers to guide improvements and adjustments.

References and additional resources

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- *Sperling et al., 2006. Seed aid for seed security: Advice for practitioners. Practice Briefs 6-10.*
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