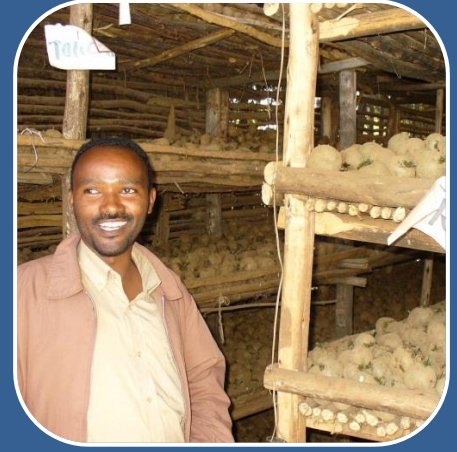


# Seed Systems Analysis (SSA)



## WHAT is seed systems analysis?

The seed systems analysis (SSA) is a multi-stakeholders process oriented tool to understand the composition, distinctness and variations within a seed sector of specific country or geographical location. It takes the systemic perspectives in analyzing the role of informal and formal seed systems and complexity within it. It helps to identify specific seed system by its domain of operation (farmers, public, private, NGO, others), the types of crops and varieties, types of farmers targeted, types of seed quality assurance mechanisms, and types seed dissemination mechanisms. Results of SSA enhances awareness on the existence and relevance of dissimilar systems that co-exist and co-evolve within a seed sector. Based on evidence, and endorsed through an inclusive multi-stakeholder process, vital inputs are generated for the development of specific intervention strategies in targeted seed systems.

## WHY seed systems analysis guided by integrated approach ?

A diversity of systems supply seed to cater to the equally diverse demands of farmers. No single intervention, be it public-, private-, community-, or NGO-based, can provide sufficient support to the seed sector for achieving the goal of seed security at community, national, regional or global levels. Individual farming households use distinct seed systems for different crops. Crops for household consumption, like sorghum, rice, finger millet and beans are cultivated using farmer-saved seed; local cash crops, such as groundnut and common beans, are grown with seed from semi-commercial sources; maize seed is obtained from national public research institutions, either through government extension services, or distribution programmes; and seed of exotic vegetables is purchased from international commercial companies. This demonstrates that the seed sector hosts a complex reality of different seed systems, even at the household level, which need to be approached in a pluralistic manner. Integrated seed sector development (ISSD) recognizes the unique role played by each of these different seed systems within the overall sector, and the need to approach them individually. Each system involves a diversity of stakeholders, such as farmers' seed producer groups, public genetic resource and research entities, universities, private seed companies (local, regional, national and international), NGOs and agro-input dealers; each of these stakeholders assumes specific responsibilities in dissimilar seed systems, and each plays specific roles as operators or service providers in the seed value chain that is associated with that seed system.

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### Box 1. Most common seed systems within the seed sector

**Farmer-saved seed:** The most prominent source of seed for the majority of farmers in developing countries, and also for many crops in the developed world, is farmer-saved seed. Farmers obtain seed through both informal and formal networks. Varieties can be both local and improved. The crops are largely for subsistence and food security, but in many cases may also be used for income generating purposes.

**Community-based seed production:** Farmers source seed of locally important food and cash crops through this system. Non-governmental organizations (NGOs) are actively involved in supporting communities with the aim of enhancing food security and reducing poverty. This system includes both local and improved varieties, and may involve formal seed quality procedures, such as quality declared seed or truthfully labelled seed.

**Local seed business:** Farmers multiply and sell small quantities of quality seed of improved varieties to other farmers in this intermediary seed system. It may include formal seed quality procedures, such as quality declared seed and certification. This system includes major food crops, as well as vegetables and perennial fruit trees, and mostly uses local or nationally improved varieties.

**Government seed companies and/or programmes:** There are various (mostly public) operators in the seed value chain in this system, in which the seed is certified and varieties are improved. In most developing countries, governments invest their resources in the production and dissemination of crops that are important for food and nutritional security through this system; these include cereals (maize, rice, wheat and several others), legumes and vegetables.

**Commercial seed companies:** In this seed system, commercial companies are either directly engaged in seed production through contract farming and out-growers schemes, or in importing seed of high value food and cash crops, which are subsequently marketed through their own networks and/or agro-input dealers. Hybrid maize, hybrid rice, exotic vegetables and perennial fruit trees are the main crops for which this system is operational.

**Seed relief:** In the event of an emergency due to the human conflicts or natural disasters, seed is freely distributed to farmers as a form of relief, in order to support their recovery. The varieties and seed quality standards are usually unknown, which is a concern, in terms of the long-term sustainability of the seed sector.

**Closed value chain:** This seed system usually has a short value chain, where seed (including planting materials) and input packages are directly provided to the commercial growers. The system includes crops such as cotton, tea, coffee, tobacco, and sugarcane.

## How to perform seed systems analysis: technical guidance for the design process?

SSA is one of the tools of national seed sector assessment (NSSA) therefore it follows the similar multi-stakeholders process as described in the technical notes issue no 1. In concisely, the process includes a national team formulation consisting of a representative of seed sector stakeholders from agriculture ministries or public research, agriculture universities or faculties, associations of private seed companies, agro-input dealers, civil society organizations, and farmers' organization. This team organises the field appraisals; interviews or focus group discussion with key stakeholders, share and validate the results in different round-table meetings and consolidate the strategic actions.

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For SSA, the national team organises field appraisals with aid of specific guiding questions and checklists as mentioned below:

### **Step 1. Characterization of the seed systems**

This is the first entry point to understand an overview of different types of seed systems within a national seed sector. Each seed system is distinctly characterized with the help of following key guiding questions:

- Domain: What is the key domain of specific seed system (public, private, informal, mixed, other)?
- Crops: What types of crops does the specific seed system comprise (food, cash, feed, export)? What are the major crops covered (rice, sorghum, maize, indigenous or exotic vegetables, root and tuber crops, etc.)?
- Varieties: What type of varieties are included (landraces, local varieties, modern varieties, exotic or foreign varieties)?
- Reproduction system: What are dominant reproduction systems used (selfing, out-crossing, vegetatively propagated, perennial trees)?
- Seed value chain: Who are the main seed value chain operators (breeders, seed producers, seed marketing/dissemination)?
- Quality assurance system: What types of seed quality assurance mechanisms are used (informal, quality declared, certified, accreditation)?
- Service provision: What types of services are provided for strengthening the seed value chain (provision of basic seed, quality assurance, marketing, promotion)? Who are the service providers?
- Seed distribution: What types of distribution and marketing mechanisms are used? Who are involving?
- Seed supply: What is the estimated % of seed supply by the system within the entire sector?
- Strength and opportunities: What are the current strengths, gaps and opportunities of the different seed systems?

The responses of the questions are incorporated into a summarized matrix that includes the seed systems (in the columns) and questions (in the rows). The multi-stakeholder team consolidates this preliminary analysis of the seed system.

### **Step 2: Consolidation and strategic actions**

The first draft report includes the results of the step 1 serves as evidence-based input for a series of roundtable meetings. The round-table meetings could involve participation of stakeholders from public sector, private sector, civil society and seed programmes, and farmers' organisations. The aims of the round-table meetings include the following:

- What are the different seed systems within the national seed sector (validation)?
- What are the unique roles of each seed systems?
- What are the key issues and challenges in various seed systems?
- What are the strategic actions to solve the issues?

Following the series of round table meetings, the multi-stakeholder team consolidates the outcomes of the round-table meetings and finalizes the analysis report.

## **WHAT kind of outputs does an SSA produce?**

We illustrate here the results of an SSA as conducted in two African countries. The seed sector in Mali is characterized by four seed systems: farmer-saved seed; community-based seed production; a mixed system with public and community-based components in production and marketing through commercial agro-input dealers; and a system associated with a closed value chain. The Zambian seed sector is characterized by six seed systems, and is considered more complex than that of Mali. In Zambia, national and international seed companies play distinct roles; however, as

in Mali, different systems exist for farmer-saved seed, community-based seed, and closed value chain seed systems. There is even a specific system that addresses vegetatively propagated crops, which are multiplied and distributed in emergency situations. A closer look of each sector in the two countries reveals that the variation of systems operates in quite different enabling environments. In each country, the seed sector includes distinct crops, and quality assurance and marketing mechanisms are organized in different ways. The comparison of just two countries shows that the seed sector in every country is unique, although the analysis offers an insight that is fixed to a unique moment in time, as the structure and diversity of systems may gradually evolve and change.

Seed system	Farmer-saved seed	Community-based	Mixed with agro-dealers	Closed value chain
Type of crop(s)	Local food crops	Local food and cash crops	Major food crops	Value chain crops
Major crops	Sorghum, millets and bambara groundnut	Sorghum, maize and groundnuts	Maize, rice and groundnuts	Cotton
Types of varieties	Local	Local and improved (open-pollinated varieties)	Improved (open-pollinated and hybrid)	Improved
Type of system	Farm-saved, informal	Informal, unofficial quality declared and certified	Certified	Certified
Dissemination system	Farm-saved and exchange, informal 'grain' markets	Local marketing	Marketing	Input package

**Figure 1: Overview of the seed systems of Mali**

Seed system	Farm-saved seed	Community-based (associations)	Community-based, NGOs and public	National companies	International companies	Closed value chain
Type of crop(s)	Local food crops	Food and crops	Food crops (roots and tubers)	Food and cash crops	High input cereals	Closed value chain crops
Major crops	Cereals and pulses	Cereals and pulses	Cassava and sweet potato	Maize, beans, soy bean and groundnut	Maize and wheat	Cotton, tobacco, malting barley
Type of varieties	Local	Local and improved	Improved	Improved (open-pollinated varieties and hybrid)	Improved (hybrid)	Improved
Type of system	Farm-saved, informal	Informal, quality declared seed (QDS) and certified	Quality planting material and informal	Certified	Certified	Certified
Dissemination system	Farm-saved and exchange, informal markets	Exchange, local marketing	NGO distribution and local marketing	Marketing, agro-dealers and government dissemination (maize)	Export, marketing, agro-dealer networks and government dissemination (maize)	Input package

**Figure 2: Overview of the seed systems of Zambia**

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## WHAT lessons can be learned?

An SSA is a crucial, primary tool for developing seed programmes and policies that are guided by the ISSD concept. It has been used in several countries since 2010, and has contributed to the development of seed programmes and policies in ten African countries (Burundi, Ethiopia, Ghana, Mali, Malawi, Mozambique, Rwanda, South Sudan, Uganda and Zambia), which illustrate the many similarities, and also several differences, between the seed sectors of these countries. In Rwanda, one seed sector development programme, based on SSA, is focusing on strengthening the role of the public and private sector within seed value chains, while promoting community-based seed production for specific crops. In Uganda, an ISSD programme has been developed which is guided by SSA. In Ethiopia, an ISSD programme based on SSA has been developed that focuses on supporting local seed business and private sector development; strengthening public seed enterprises; and promoting the role of universities as facilitators in seed sector development, addressing specific innovation in the interplay between public, private and civil society organizations.

The goal of a SSA is to obtain better-informed insights into the complex and dynamic realities of the various different national seed sectors, for contributing to the development of seed programmes and policies that recognize and support different options through pluralism, and which promote dissimilar development pathways in this diverse sector. Rather than adopting a single or linear approach towards strengthening the sector, multiple approaches that are tailor-made to each situation are identified, as input for programme and policy development. The relevant policy and legal mechanisms, such as seed laws, variety release, plant variety protection, and access and benefit-sharing, can be addressed in an appropriate manner. Evidence-based analysis, and consultations involving a wide range of stakeholders facilitate the development of policies that match the diverse and complex realities of the seed sector, thereby identifying better develop pathways towards improving the performance of the sector in providing quality seed to farmers. An SSA is an action-oriented tool with strong consultative and multi-stakeholder process elements, which creates awareness, enhances capacities and promotes ownership among the various stakeholders. As such, SSA acts as a platform for the coordination of multiple interventions, thus replacing the previously dominating linear model and its blanket solutions in seed sector development.

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## Reading materials

- Louwaars, N.P., De Boef, W.S. (2012). Integrated seed sector development in Africa: a conceptual framework for creating coherence between practices, programs and policies. *Journal of Crop Improvement* 26, 39-59.
- Louwaars, N.P., De Boef, W.S. and Edeme, J. (2013). Integrated seed sector development in Africa: a basis for seed policy and law. *Journal of Crop Improvement* 27: 186-214.
- Integrated seed sector development in Africa – programme webpage, hosted by Wageningen University and research centre, at URL [www.wageningenur.nl/en/show/Integrated-seed-sector-development-in-Africa.htm](http://www.wageningenur.nl/en/show/Integrated-seed-sector-development-in-Africa.htm)

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## Technical note

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## Annex 1: Main steps and guiding questions for seed system analysis (SSA)

Main step and actions	Issues and questions to be addressed
<p><b>Step 1</b> Characterization of seed systems</p>	<p>Make a summary of matrix for key guiding questions (in column) and information (in row):</p> <ul style="list-style-type: none"> <li>- <u>Domain</u>: What is the key domain of specific seed system (public, private, informal, mixed, other)?</li> <li>- <u>Crops</u>: What types of crops does the specific seed system comprise (food, cash, feed, export)? What are the major crops covered (rice, sorghum, maize, indigenous or exotic vegetables, root and tuber crops, etc.)?</li> <li>- <u>Varieties</u>: What type of varieties are included (landraces, local varieties, modern varieties, exotic or foreign varieties)?</li> <li>- <u>Reproduction system</u>: What are dominant reproduction systems used (selfing, out-crossing, vegetatively propagated, perennial trees)?</li> <li>- <u>Seed value chain</u>: Who are the main seed value chain operators (breeders, seed producers, seed marketing/dissemination)?</li> <li>- <u>Quality assurance system</u>: What types of seed quality assurance mechanisms are used (informal, quality declared, certified, accreditation)?</li> <li>- <u>Service provision</u>: What types of services are provided for strengthening the seed value chain (provision of basic seed, quality assurance, marketing, promotion)? Who are the service providers?</li> <li>- <u>Seed distribution</u>: What types of distribution and marketing mechanisms are used? Who are involving?</li> <li>- <u>Seed supply</u>: What is the estimated % of seed supply by the system within the entire sector?</li> <li>- <u>Strength and opportunities</u>: What are the current strengths, gaps and opportunities of the different seed systems?</li> </ul>
<p><b>Step 2</b> Consolidation and strategic actions</p>	<p>Results of steps 1 shared in round-table meetings to validate and consolidate the information and develop a strategic action plan:</p> <ul style="list-style-type: none"> <li>- What are the different seed systems within the national seed sector (validation)?</li> <li>- What are the unique roles of each seed systems?</li> <li>- What are the key issues and challenges in various seed systems?</li> <li>- What are the strategic actions to solve the issues?</li> </ul>