

# Seed Emergency Response Tool

Guidance for Practitioners

June 2022

## About ISSD Africa

**Integrated Seed Sector Development (ISSD) Africa** is an international community of practice, guiding seed sector innovation and development on the African continent to alleviate the problem of limited access to quality seed.



## About Mercy Corps

**Mercy Corps** is a leading global organization powered by the belief that a better world is possible. In disaster, in hardship, in more than 40 countries around the world, Mercy Corps partners to put bold solutions into action – helping people triumph over adversity and build stronger communities from within. Now, and for the future.



## About SeedSystem

**SeedSystem** provides practical ('how-to') guidance and strategic thinking to help professionals design seed-related assistance. It aims to foster productive, resilient, and market-oriented seed systems, even in times of emergency and chronic stress.



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## Acronyms

AAR	After Action Review
ARRP	Agriculture Recovery and Resilience Project
BHA	Bureau of Humanitarian Assistance
CARE	CARE International
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Center
COVID-19	Coronavirus Disease
CRS	Catholic Relief Services
CVA	Cash and Voucher Assistance
DiNER	Diversity in Nutrition and Resilience
DSD	Direct Seed Distribution
EMMA	Emergency Market Mapping and Analysis
FAO	Food and Agriculture Organization
FSN Network	Food Security and Nutrition Network
GMO	Genetically Modified Organism
HH	Household
HIV	Human Immunodeficiency Virus
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDP	Internally Displaced Person
IFPRI	International Food Policy Research Institute
ISSD Africa	Integrated Seed Sector Development in Africa
LSB	Local Seed Business
MSA	Market System Analysis
NGO	Non-Governmental Organization
NRI	Natural Resources Institute
ODI	Overseas Development Institute
OECD	Organization for Economic Cooperation and Development
OFDA	Office of U.S. Foreign Disaster Assistance (now part of BHA)
PABRA	Pan-Africa Bean Research Alliance
PICS	Purdue Improved Crop Storage
QDS	Quality-Declared Seed
S34D	Supporting Seed Systems for Development
SDC	Swiss Agency for Development and Cooperation
SEADS	Standards for Supporting Agricultural Livelihoods in Emergencies
SERT	Seed Emergency Response Tool
SMS	Short Message Service
SSA	Seed Security Assessment
SSF	Seed Security Framework
SSSA	Seed System Security Assessment
SVF	Seed Vouchers and Fairs
UN	United Nations
USAID	United States Agency for International Development
VPC	Vegetatively Propagated Crops
WFP	World Food Programme

# 1 Introduction

## 1.1 Emergencies and seed-related assistance

Emergencies, whether triggered by natural disasters or events of human origin, often disrupt the lives of farm families and their agricultural production. Smallholder farmers<sup>1</sup> in developing countries are particularly vulnerable and are increasingly dealing with a range of shocks and stresses, including climate variability, conflict, and COVID-19. During emergencies, humanitarian practitioners need to intervene quickly to help restore the local farming system to its pre-disaster state or better, ensuring farmers under stress can resume producing food and become more resilient – even in the short term.

Seed interventions are a particular focus of humanitarian aid in these times of stress as seed is relatively easy for farmers to use and can give quick returns. Seed-linked interventions are also considered cost-effective as seed multiplies its own products<sup>2</sup>. In theory, giving seed aid decreases the need for food aid. Practice on the ground, however, has often proved otherwise.

Emergency seed interventions have escalated over the years and to an ever-widening set of countries. The Food and Agriculture Organization of the United Nations (FAO) alone had seed plans for 48 countries during the 2008 food security crisis (McGuire and Sperling, 2011). Beyond its increasing scale, seed aid has become repetitive: Ethiopia, 42+ years in a row, and Burundi 38 seasons since 1995 (FSN Network, 2020). Also, emergency seed aid is increasingly being used to compensate for developmental failings, especially around new variety dissemination (Sperling et al., 2020). For example, new drought-tolerant varieties that may not be reaching farmers are routinely distributed free under the umbrella of emergency or chronic-stress aid (e.g., CIMMYT, 2016).

Seed aid as a form of intervention has expanded especially in Africa, from the early 1990s onwards. While it has a benign image – ‘give seed and help farmers’ – results on the ground suggest seed aid can actually increase farmers’ vulnerability. Seed that arrives too late or poorly adapted seed wastes farmers’ land and labor resources. Aid repeated over multiple seasons breeds farmer dependency and stifles the development of commercial seed enterprises (Bramel et al., 2004).

Avoiding these pitfalls has become a major concern of professionals, intent on delivering better emergency seed aid and better support to seed systems. In response, general guidance on effective seed aid practice has increased (e.g., SEADS, 2022), and tailored advice on specific types of interventions has also been on the rise (Direct Seed Distribution, FAO, 2010a; Seed Voucher and Fairs, CRS, 2017; vegetable seed programming, Pincus et al., 2017; market-based seed interventions, Walsh and Sperling, 2019; etc.). Nonetheless, there are still gaps in our knowledge, and suggested interventions have often not kept pace with lessons from the field, or do not incorporate evolving ‘better practices’.

Seed interventions are a particular focus of humanitarian aid in times of stress as seed is relatively easy for farmers to use and can give quick returns.

Inappropriate seed aid increases farmers’ vulnerability.

1 Smallholder farmers are the focus of this document. Throughout, this term refers to both male and female farmers, with female farmers’ challenges and marginalization highlighted where appropriate.

2 For example, a farmer sowing 1 kg of sorghum seed can harvest 100 or even 200 kg of food.



## 1.2 The Seed Emergency Response Tool (SERT)

### Who might use this SERT?

This SERT is for **policy makers, program managers, and field staff engaged in emergency and early recovery agricultural responses**. It should help ensure that those new to this area of work, as well as those with experience, can make informed, quality decisions about the choice of a seed security intervention and how best to implement it.

Effective seed security responses require more than logistical expertise in the procurement and delivery of seed. They demand strategic thinking and deliberate design actions. Clear goals must be set; choices among ‘equally good interventions’ need to be mapped out; and the selection of appropriate responses must be geared to equitably meet the varied needs of men and women farmers. This SERT provides guidance on how best to tackle these tasks.

### SERT structure

The SERT structure broadly follows the timelines and sequence of activities one might face in the field:

- 1 Gaining the fundamentals of seed system knowledge
- 2 Understanding the seed security problem(s), including possible differences in access to seed by farmers and those from marginalized communities
- 3 Reviewing and comparing potential response interventions
- 4 Focusing on a particular response (or set of responses) for a given context
- 5 Implementing ‘good practices’ (or the best possible ones) for that response

The SERT has two main components. First, **it presents the background and concepts needed to understand how farmers in stress periods might obtain the seed they want and need**. This includes information on diverse seed systems and seed security features. The base information also summarizes the range of interventions available to help implementers move beyond traditional methods like direct seed distribution and to think about other ways of doing things, with particular emphasis on market-based interventions. The SERT emphasizes use of seed interventions not just as tools for overcoming short-term shocks or stresses, but as key levers to enable farmers to “build back better” and improve their and the system’s overall resilience.

Second, **the tool synthesizes the growing body of ‘good or better practices’ linked to seed security planning, assessment, and response**.

This practical advice is framed by a set of 10 core principles and accompanied by innovative and handy, field-tested tools: decision trees for choosing a suitable intervention; checklists for evaluating responses; and reference materials for those seeking more technical detail.

The SERT is not a complete A-to-Z guide, although it does steer users to various additional technical manuals. Rather, the SERT aims to give an overview of the key information needed for informed decision making, and to supplement critical thinking with practical guidance.

While the guidance and lessons shared in this SERT largely focus on smallholder farmers in Africa, the tool has wider geographic application.



Photo: Kyla Yeoman/Mercy Corps

## 2 Fundamentals of seed systems and seed security responses

To intervene effectively in seed systems, and have a positive impact on farmers' seed security, practitioners need to understand several core technical elements of seed-related assistance:

- Smallholders use multiple seed systems and these differ by crop.
- Seed security has four critical features, all of which need to be addressed.
- Seed security programming can have diverse goals, and these should directly shape on-the-ground implementation.

### 2.1 Seed systems used by smallholder farmers

**Smallholder farmers routinely tap multiple sources of seed. All seed systems merit support to enable access to necessary varieties.**

Smallholder farmers access seed through a variety of channels. The major ones fall into two categories: formal and informal seed systems, with additional 'intermediary' seed systems occasionally drawn on, but to a much lesser extent (AgriLinks, 2020; Sperling et al., 2006).

The **formal seed system** provides farmers with new 'modern' varieties that are offered as 'high quality', certified or quality-declared seed (QDS). Formal channels include government bodies and commercial companies. Within formal systems, seed and grain are produced differently, with clear standards dictating what may or may not be labeled as seed.

The **informal seed system**, also known as the 'local', 'traditional' or 'farmer' seed system, centers on farmer or local varieties. The informal system includes most of the ways farmers and traders themselves produce, select, disseminate, and procure seed: directly from home harvest, through barter or sale among friends, neighbors, and relatives, and through local grain markets and traders. In the informal system, seed is mainly produced or sorted as an integral part of grain production, and not as a discrete enterprise, although a small portion is sometimes produced and managed as seed specifically. Despite its name, the informal seed system also plays a role in moving modern varieties, sometimes labeled 'improved', that have been further multiplied on farm.

**Intermediary seed systems** refer to varied, small-scale enterprises, often local. They integrate elements of both formal and informal seed systems. They may include community-based seed producers, farmer cooperatives, and Local Seed Businesses (LSBs), among other forms (ISSD-Uganda, 2015).

Smallholder farmers routinely tap these multiple sources for their different seed needs. For example, in Southern Africa, farmers typically procure maize hybrids through agrodealers (formal) and sorghum seed from their own harvest or from neighbors (informal). Smallholders might also use multiple channels even for a single crop. Bean farmers in much of East Africa, for example, obtain some seed from their own stocks, some from markets, and might also get seed of new varieties from an extension agent or research station.

Evidence shows **smallholder farmers access over 90% of their seed from the informal system**, with local markets being particularly important. Seed from the formal system accounts for only about 3% of what is sown (dominated by maize), and the intermediary system's share is less than 0.5%. The rest comes from a variety of sources, including aid projects (McGuire and Sperling, 2016). Figure 1 depicts these seed systems and their interconnections.



Photo: Louise Sperling/SeedSystem

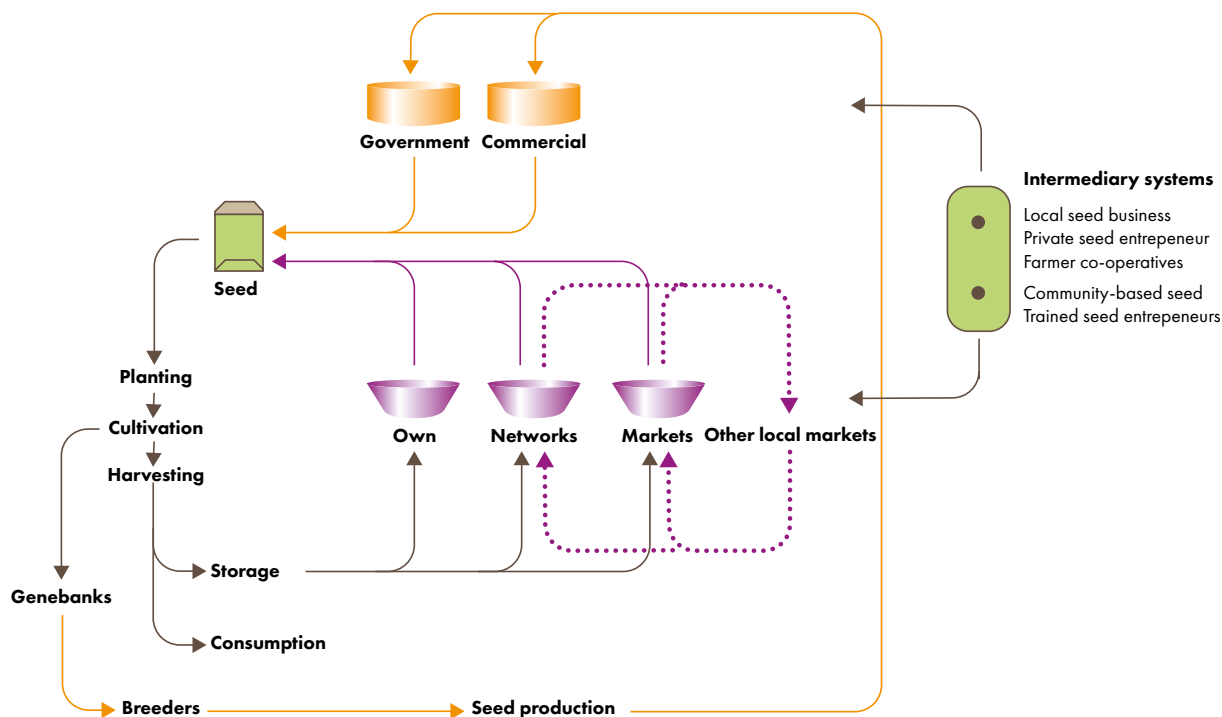
Smallholder farmers access over 90% of their seed from the informal system, with local markets being particularly important.



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**Figure 1 Seed systems and their interconnections**



Channels through which farmers obtain seed are depicted by the cylinders. Farmers' own seed stocks, social networks, and local seed/grain markets constitute informal channels. Commercial seed companies, and government or research outlets are formal channels. Intermediary forms vary, but can include farmer cooperatives and other community based seed sources.

Source: modified and expanded from Almekinders and Louwaars, 1999

Whether formal, informal or intermediary, all relevant seed systems merit support if farmers are to access the crops and varieties they need. Also, practitioners should not assume that a breakdown in one seed channel means a breakdown in all as a disaster may affect seed channels differently (see Box 1). In times of social upheaval, notably civil war, formal channels like government seed enterprises may cease to function, while informal ones, like local markets, often continue to operate. Conversely, in times of severe plant disease outbreak – for example, cassava mosaic virus in East and Central Africa – formal channels that supply disease-resistant varieties and clean planting material may prove more durable. More information on different types of disasters and how they affect various seed channels is presented in Section 4.

**> All the seed systems farmers routinely use merit support.**

**Box 1 Different seed channels may be affected by a crisis in different ways**

Some seed channels are more durable than others. In Rwanda, before the war and genocide crisis from 1990 to 1994, farmers, particularly in the north, had come to rely on formal sector sources for potato seed as well as for new potato varieties. The war disrupted this supply early as the parastatal responsible for multiplying potato seed was in the center of a combat zone. Development projects, delivering certified seed and new varieties, also phased out activities as insecurity grew. In contrast, local markets – the main sources for bean seed – continued to diffuse local grain and informal

seed during some of the worst periods of the conflict and displacement events.

Hence, potato production that relied on the formal sector for modern varieties and clean seed, virtually collapsed, while bean seed channels and production based on farmers' local systems, continued largely on course. It is important to understand such dynamics if one is to build on what is resilient during high stress periods

Source: Sperling, 1997

## **Box 2** IDPs have special seed security needs

Successful emergency seed work for refugees and IDPs depends on a number of factors – for example, whether the agroecology of the new location is the same as that of the population’s home areas; whether the displaced population is a cohesive one; and whether infrastructure is in place in the new area. The more the new locale differs from the old, the greater the challenges for a seed-related program.

Before engaging in seed-related activities, practitioners should consider three key factors:

**1 Land access** Seed-related work requires access to land for long enough to sow and harvest specific plots. Refugees and IDPs often move into areas where communities already live and farm. If land tenure arrangements are unclear or unfavorable towards the old or new residents, distribution of seed could aggravate already hostile relationships with the host population or among the beneficiaries. If an agency suspects that a seed-related response has the potential to stimulate conflict, non-seed response activities should be explored.

**2 Non-seed agricultural support** Populations on the move often have relatively little agricultural equipment, especially if the move was involuntary. This means that agricultural aid may have to go beyond seed to include full sets of agricultural equipment, storage containers, food

processing tools, etc. Non-seed training may also have to be expanded. For example, emergency vegetable seed programs are frequently recommended for refugee and IDP contexts, as vegetables generally require only small cultivation spaces, have quick maturing cycles, and are presumed as good for nutrition. A recent review shows that response programming needs to go beyond distributing adapted vegetable seed – to more holistic actions such as strengthening gardening techniques, marketing expertise, and household nutrition/cooking preparation.

**3 Appropriate crops and seed varieties** Practitioners cannot assume that traditional technical knowledge or seed transported with refugees and IDPs is adapted to the new location. Practitioners may need to introduce new crops and varieties that are better adapted to the new agricultural zones. Alongside these, practitioners need to provide appropriate technical information (e.g., through training and leaflets) that addresses the challenges of new planting materials, unfamiliar soil types, and new pests and diseases.

Given these considerations, unless a practitioner has the financial resources to support IDPs and refugees through an adjustment process, they should consider non-seed responses.

Sources: ODI, 1996; Pincus et al, 2017

Likewise, practitioners should be clear on who is most impacted by a shock. Stresses vary from one group to another, and the effects are often heaviest among women and marginalized people. Internally Displaced Persons (IDPs) are a special case where seed security issues present distinct challenges (see Box 2).

## **2.2 Seed security framework**

**Seed security for farmers has four distinct features all of which should be addressed.**

The seed security framework (SSF) outlines the four fundamental elements of seed security that are critical for smallholders:

- 1** Seed has to be available.
- 2** Diverse groups of farmers need to be able to access it.
- 3** Seed health (quality) must be sufficient to promote good production.
- 4** The varieties on offer have to be adapted and acceptable to male and female smallholder farmers and other groups aiming to use the seed (variety suitability).

While features 3 and 4 are sometimes grouped together under the heading ‘seed quality’, they concern quite distinct aspects of seed: the first focuses on health/sanitary aspects, the second on genetics/variety traits. See Table 1 and Appendix I.

**Table 1 Seed Security Framework (SSF): basic features**

Seed Security Feature	Description
<b>Availability</b>	Sufficient quantity of seed of adapted crops is within reasonable distance of farms (spatial availability) and in time for critical sowing periods (temporal availability).
<b>Access</b>	Diverse groups of people have adequate income or other resources to purchase or barter for seeds and have physical access to multiple seed sources.
<b>Seed health/quality</b>	Seed is healthy, with good physical, physiological, and sanitary quality.
<b>Variety suitability</b>	Varieties are adapted, respect the preferences of women and men farmers, and are market-acceptable.

Source: modified from Remington et al., 2002

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.

In situations of stress that damage seed system functioning, it is rare that all four seed security features – availability, access, seed health, and variety suitability – are compromised together. The challenge is to identify clearly which feature or features are threatened or failing and take corrective action.



Seed security means diverse groups of farmers have regular, predictable access to seed of suitable varieties.

Photo: Georgina Smith/PABRA

### 2.3 Seed security program goals

**Seed security programs may have diverse goals. Each specific goal should shape program design and implementation.**

Increasingly, seed assistance is moving beyond the basic goal of helping farmers obtain enough seed to achieve food security. Depending on the farmers’ visions and needs, seed security assistance might also have other goals such as to bolster household nutrition, family income, and farming system resilience. Each specific goal will shape practical program design, the kinds of crops and varieties put on offer, and their specific varietal traits, among other things (Table 2).

While presented below as distinct, many of the goals are interconnected. For example, food production may be linked to income generation, especially when harvests are sold, or income generation may be linked to nutritional goals, especially when high-end markets focus on nutritional characteristics (e.g., superfoods like quinoa).

Prior to implementation, these goals should be set explicitly, with male and female farmers' needs driving the choices. Goals must meet farmers' immediate needs, not implementers' desires. For instance, implementers may want to leverage an emergency to introduce new varieties (sometimes to increase 'variety turnover'). While recipient collaborating communities may share this goal, that joint vision needs to be confirmed.

Seed security programs can have different goals requiring different intervention features. Plan accordingly.

**Table 2 Select design features of seed security programs with different goals**

Goal	Crop/variety issues: broad choices	Varietal features	Awareness-raising, information strategy
<b>Food production</b> (classic approach)	Major staple crops. Crops/varieties responsive to inputs.	Preferred agronomic traits (e.g., high yield, early maturity, resistance to specific stresses). Preferred end user traits for consumption, especially postharvest processing and cooking qualities. Preferred end user traits for market acceptance.	Use of 'classic channels': agricultural extension visits; posters; field days; rural radio. Might increasingly use social networking, mobile phones, SMS.
<b>Nutrition</b>	Focus beyond calories to include nutritive elements. Varieties biofortified with micronutrients. Crops contributing to dietary diversity. Specialty crops: leafy vegetables, orange-fleshed sweet potatoes.	Key agronomic acceptance traits as well as targeted nutritional traits such as high micronutrient content. Diet-diverse germplasm set, maybe including indigenous crops, leafy greens, legumes, and biofortified varieties and crops.	Information strategy geared to showing value of nutrition, and guidance on food preparation. Targeting decision makers on food consumption and nutrition including men (determining expenditure on more nutritious food) and women (determining who eats what) Sophisticated demand-creation techniques (possibly to reach an unconventional buyer: malnourished, vulnerable).
<b>Climate resilience</b>	Crops that tolerate abiotic stress: ● heat tolerant crops/varieties, water efficient crops/varieties. Crops that add value or diversity to resource base: ● legumes to fix nitrogen ● fodder crops, perennials.	Diversity that is 'useful': allows for staggered sowing (short and longer duration). Varieties that are adapted to stresses (e.g., moisture, heat, pests, low fertility). Crops that are bundled to encourage better rotational systems, improved soil health and water management.	Information geared to zone, 'crop portfolio-management' scenarios Use of decision-making tools focused on real-time farming system scenarios and analysis of adaptation zones.
<b>Income generation</b>	Crops geared to markets ('high value crops'). Crops linked to value-added/processing chains Crops linked to non-food livelihood activities (e.g., fiber production).	Varieties/crops that meet rigorous market requirements, including uniformity (note that varieties may be suboptimal in agronomic terms).	Sophisticated demand creation techniques across full value chain (including processors as well as users and buyers of raw products). Successful branding of seed product and packaging.

Source: modified from Sperling and McGuire, 2012

## Resilience

Achieving greater resilience has become central to seed assistance programs in emergency settings, particularly those operating in climate stressed zones. Resilient seed systems must have the capacity to absorb and adapt to shocks and stresses, and to reorganize to maintain and strengthen seed security over time (McGuire and Sperling, 2013). Practitioners should aim not only to help farmers and other market system actors (e.g., traders, transporters) to recover from shocks and stresses, but also to 'build back better' by increasing their resilience capacities to:

- minimize sensitivity to shocks and stresses (absorptive capacity); and
- modify conditions and practices proactively in anticipation of, or as a reaction to, shocks and stresses (adaptive capacity).

Also, capacity building needs to address the underlying cultural, institutional, and learning dynamics within a system and to enable communities to absorb and adapt over time (transformative capacity) (Mercy Corps, 2019).

The features of resilience programming in seed systems are still being debated and refined within a growing body of resilience experience. Box 3 lists basic elements of resilient seed systems which can be supported even during an emergency response. Basic resilience features should be woven into the overall intervention design.

Resilient seed systems must have the capacity to absorb and adapt to shocks and stresses, and to reorganize to maintain and strengthen seed security over time.

### Box 3 Features of seed systems programming aiming for resilience

- **Systems** The focus of program interventions goes beyond seed, to incorporate activities that develop institutions, relationships, and knowledge, spanning processes in both formal and informal systems.
- **Diversity (crops and varieties)** Example: male and female farmers have access to a diverse array of crops and varieties to anticipate fluctuating conditions and various climatic stresses. (This does not necessarily mean new crops and varieties, but rather that farmers grow drought-tolerant, flood-tolerant or short- maturity crops, and diversify crop production strategies to incorporate different stress tolerances.)
- **Diversity (supply channels)** Example: male and female farmers have access to a wide variety of crops and varieties through social networks, formal, and local markets. Diverse suppliers may also operate within these different channels.
- **Availability and access** Seed of stress-tolerant crops and varieties is multiplied and seed production is scaled up (i.e., made available equitably to diverse groups of farmers, ensuring vulnerable farmers can re-sow if needed). The right seed needs to be available and accessible not just for the imminent planting season, but also for several seasons thereafter.
- **Mobilization** Groups and collective actions need to be catalyzed at multiple levels to respond to farmers' immediate needs and help communities avoid shocks or reduce shock stress impacts (e.g., farmer organizations promoted).

Source: modified from McGuire and Sperling, 2013; Mercy Corps, 2019



Photo: Georgina Smith/PABRA

### 3 Understanding the seed security problem

The first steps in the process of choosing emergency seed interventions are to determine whether a seed security problem(s) actually exists and, if so, how to assess it with enough precision to act in a targeted manner. This section provides practical guidance on both, and ends with reflections on seed security problems and specific disaster type, and ends with reflections on seed security problems and specific disaster types.

Food security and seed security are linked but are not the same: each needs a focused assessment.

#### 3.1 Seed security assessment vs food security assessment

Until relatively recently, seed security was assessed mainly through the lens of food security. If a food security assessment identified food deficits, it was assumed seed was needed as well, and seed was simply added to the food aid provided. The same assumption was made if the harvest dropped or failed. The assumption, however, has proven to be false. Basic agronomy shows a production shortfall doesn't necessarily lead to a seed shortfall even accounting for seed sorting and a possible need to re-sow. As an example, small-seeded crops generally have high multiplication rates; thus, only a small proportion of the harvest is needed for future seed (see Box 4).

##### Box 4 A production shortfall does not necessarily lead to a seed shortfall

For the dominant small-seeded grain crops of dryland Africa – millet and sorghum – typically less than 5% of the harvest is needed for seed. Even in a bad year, the seed requirement is unlikely to be a significant drain on the harvest. Large-seeded crops such as groundnut, however, may require up to 10% of the harvest as the seed reserve.

For many crops analyzed in African contexts – for example, common bean, fava bean, maize, sorghum, groundnut, wheat, and tef – enough seed is potentially available even if harvests drop 80–90%. The qualifier 'potentially' is used as the quality of harvested seed has to be adequate and farmers have to be able to save sufficient stocks until sowing.

Example of sowing needs in relation to harvests for typical land areas grown for pearl millet and groundnuts by farmers in Douentza Circle, northern Mali:

	Pearl Millet (1 ha)	Groundnut (1/4 ha)
Sowing needs (kg/by normal production area per farmer, with sorting and re-sowing factored in)	10–20 kg	15 kg
Harvest (on normal production area per farmer)	430 kg	125 kg
% of harvest needed for seed	3.4	12.0

Source: Mali SSSA, (2006)

While seed security and food security have some elements in common, they are nevertheless quite different states of security and require different interventions. A farmer can have enough seed to sow a plot, but lack sufficient food to eat at certain times of the year – for example, during the 'hungry season' prior to harvest. Conversely, a household might have adequate food but lack access to seed (or the right seed) for planting. This happens more rarely but can occur if stocks kept in the house become infested with insect pests, or if a disease outbreak requires a switch to a new resistant variety.



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## 3.2 The Seed System Security Assessment (SSSA/SSA)<sup>3</sup>

Practitioners should carry out a Seed System Security Assessment (SSSA) to: a) understand what is going on during a stress period (what are the real seed security problems) and; b) choose the best (or better) response. The term 'system' is emphasized in SSSA as a holistic approach is integral, no matter what the specific methodology or sets of tools used (see footnote 3). Practitioners should not start by calculating 'seed needs' and thereby assume that tons of seed should be distributed. Rather, using an SSSA, practitioners can assess whether immediate aid is required at all and, if yes, determine what actions are needed to bolster seed systems and farm households.

While an SSSA might be spurred by an acute crisis, like an earthquake or flood, it can also be a tool for donors, governments or implementers wanting to understand 'what is really going on', on a more systemic and longer-term basis. SSSAs are often more effective when implemented by multiple stakeholders and organizations versus a single entity and their sub-partners, as much of the learning comes from having different perspectives.

### The scope of an SSSA

The SSSA reviews seed systems from individual households' and communities' points of view (both women and men), namely, the seed use or demand side. The method also reviews the system from the supply side. An SSSA can uncover specific seed security problems, including for a particular crop, and if warranted, can determine the amount of seed needed (tallying all sources of seed) and/or calculate funds needed for farmers to make adequate purchases.

While the focus of an SSSA is on understanding seed security constraints and how to lessen these, it is also useful to think about opportunities, including positive developmental actions. The results of SSSAs can help populations recover during emergencies, but can also facilitate transformative change that enables communities to absorb and adapt over the longer term.

Box 5 gives an overview of the general steps involved in an SSSA. Appendix II lists the minimum data requirements for a 'reliable' seed-linked assessment (jointly endorsed by SeedSystem and FAO).

The results of SSSAs can help populations recover quickly but can also spur transformative change enabling communities to adapt over the longer term.

3 There are multiple toolkits for effecting a Seed System Security Assessment (SSSA) or Seed Security Assessment (SSA), with both terms referring to the same process. Several sets are available at [seedssystem.org](http://seedssystem.org) and at the UN-FAO site [www.fao.org/resilience/resources/resources-detail/en/c/282218/](http://www.fao.org/resilience/resources/resources-detail/en/c/282218/). These better-known toolkits are similar and include a) background analyses guides (plant breeding, formal seed sector, varieties available), b) demand analysis tools (community and women's focus groups, individual household interview guides) and c) supply side tools (for commercial seed and local seed). Such specialized assessment tools are more effective when informed also by wider context descriptions, including foci on the vulnerable and women.

### Box 5 Seven basic steps in assessing seed system security

- 1 Identify zones for assessment + farmers' profiles + possible intervention appropriate for diverse groups of farmers.
- 2 Describe normal status of crop and seed systems.
- 3 Describe broad effects of the disaster on farming systems.
- 4 Set goals for relief + recovery operations based on male and female farmers' need.
- 5 Assess the post-crisis functioning of formal and informal seed channels to determine whether short-term assistance is needed.
- 6 Identify any chronic stresses requiring longer-term solutions + identify emerging development/market opportunities for male and female farmers.
- 7 Determine short- and longer-term responses based on analysis of priority constraints and opportunities for male and female farmers.



Source: Sperling, 2008

### Identifying acute and chronic seed security problems

When assessing seed security problems, it is important to identify whether insecurity results from a chronic stress or acute shock. The two need to be distinguished so targeted actions can address each more effectively.

**Acute seed insecurity** is brought on by distinct, short-duration events or shocks – for example, a failure to plant, or the loss of a harvest, or a high pest infestation. While in normal times most households may be seed secure, an acute shock can impact many or the majority of households, regardless of wealth or assets.

**Chronic seed insecurity** results from ongoing stresses and may be found among those who have been marginalized in different ways: economically (e.g., due to poor or inadequate land or insufficient labor); ecologically (e.g., in areas of degraded land); politically (e.g., in insecure areas or on land with uncertain tenure arrangements), or culturally (e.g., because social systems and gender inequality limit access to, and ownership of, land by women). Chronically seed insecure populations may have continual shortages of seed, with such households having built-in vulnerabilities (FAO, 2004).

Chronic seed insecurity is independent of an acute shock or disaster, although it may be exacerbated by it. However, in cases where emergencies are recurring events, for example in drought-prone areas, acute seed insecurity is nearly always superimposed on chronic problems. It is therefore not always easy to distinguish between acute and chronic seed security shocks and stresses. Table 4 presents some initial indicators to help practitioners.

It is common for seed relief practitioners to confuse chronic seed insecurity with acute seed insecurity and then promote the wrong response. Often, responses better suited to addressing acute insecurity, such as seed aid via direct distribution, vouchers, or cash, are implemented to address chronic seed insecurity – as opposed to responses that build farmer capacity in seed selection and management, or investment in specific crops and varieties that address chronic seed issues for the more vulnerable. Such quick seed aid injections only, an 'acute response', prove expensive and ineffective, as they fail to address root problems. Given the frequency of such stop-gap measures, select donors now ask for a formal review of seed aid if it is repeated three times, consecutively, in the same area (USAID, 2021). It is important, even in early emergency response stages, that practitioners give attention to more fundamental, chronic problems that render communities more vulnerable generally.

- > Repeated, quick ('acute') seed aid is ineffective (wasteful) when used to address chronic stress.
- > Seed aid given three times in a row merits review.



**Table 3 Indicators of acute and chronic seed security shocks and stresses**

Acute Shock Signals	Chronic Stress Signals
There is a lack of seed stored in houses or elsewhere in the community where it is normally maintained in quantity.	Crop failure and then purported lack of seed become cyclical, recurring perhaps every two or three years.
Seed prices in local markets dramatically spike (also, grain prices spike at sowing time).	Diverse groups of people have adequate income or other resources to purchase or barter for seeds and have physical access to multiple seed sources.
Severe insect infestations (e.g., locusts) destroy next season's planting material.	Crop profiles are changing because seed of a particular variety or crop is lacking.
Farmers lose significant assets in zones where they also routinely buy seed (i.e., spend money).	Use of 'nonpreferred' varieties, or ones farmers dislike outright, is rising. Also, farmers are sowing varieties they do not know.

When distinguishing between acute and chronic stress indicators, it is important to understand them within the local context. For example, 'farmers eating seed' is a common indicator used by the humanitarian community to signal that farmers are stressed, yet in the eastern Haiti context, for bean seed at least, this 'signal' is a false one (Box 6).

**Box 6 Is eating seed a sign of stress?**

Farmers in Biré, Haiti, eat their entire bean stock year after year. This practice is not a sign of stress. Beans are sown only one season annually and keeping seed for the next year just doesn't make sense. Beans stored for many months often fail to germinate and chemicals for keeping insects away are

often unavailable and costly. Besides, the local market can easily provide the bean varieties routinely used. So, eating their stocks is a smart move: the risk of storage is shifted to others – the local and regional seed/grain traders.

Source: Haiti SSSA, 2010



Photo: Neil Palmer/CIAT

With all of these assessment insights, the humanitarian field is now moving toward more rigorous and transparent assessment tools – the foundation of this SERT. Beyond tool development and use, there is a need to discard flawed myths and pay increased attention to the growing body of realistic evidence on the ground. Box 7 provides an example of a gender myth in Zimbabwe associated with the issue of women’s crops.

### **Box 7** Are these really women’s crops? Reflections from the SSSA in Zimbabwe, 2009

An SSSA in Zimbabwe (2009) hired a gender specialist as an integral part of the team. ‘Routine’ issues were explored, such as who chooses the crops, selects seed, and controls the harvest (see World Bank, 2009), as were issues salient to Zimbabwe and to its specific regions. Women’s land access and property rights loomed large as did the impact of outmigration and HIV/AIDS, among other issues.

One small example suggests how important regional differences might be. In Tsholotsho, the women’s focus group stated that some couples keep separate granaries. Wives fear their husbands might use harvests from their hard work to support ‘small houses’ – aka mistresses. Wives in polygamous unions also keep separate granaries.

One theme that occurred across Zimbabwe was the issue of women’s and men’s crops. Does this oft-cited stereotype hold up under practical scrutiny?

It is well known in Zimbabwe that women have special crops, and the SSSA noted this. ‘Women’s crops’ include the small grains (finger millet, sorghum, and pearl millet), sweet potatoes, as well as all the pulses (groundnut, sugar beans, cowpea, and Bambara nuts). Although used mostly for food, women can sell small quantities of their crops to purchase

items such as household utensils, clothing, and even small livestock. In theory, women also have decision-making power over their crops; they can offer gifts to relatives, neighbors, and visitors, even without asking their husbands’ permission.

But is this truism really true? Do ‘women’s crops’ exist? Evidence suggests that the gender divide is not so divided.

On the one hand, there is a tendency for women’s crops to become ‘male’ once they gain lucrative marketing value. Hence, in Murehwa, sweet potatoes, a women’s crop, became male-dominated as soon as it gained higher market value and as big volumes began moving to Harare stalls and stores.

On the other hand, 60% of communal households are headed by female, mainly because of outmigration, or mortality associated with HIV/AIDS. This means, de facto, that all crops might be ‘women’s crops’ for many households in Zimbabwe.

In this example, perhaps women have some control over crops – mostly when they have subsistence value, or when men are not present.

Source: Zimbabwe SSSA, 2009



Photo: Louise Sperling/SeedSystem

### 3.3 Seed security interventions by disaster type

The impact of a disaster – for example, drought or war – on seed security is heavily shaped by the shock type and the context. Different shocks and stresses impact seed security in different ways, and understanding these different disasters and their impact on seed systems is important for designing effective interventions. There are many factors to consider: the scale and timing of the disaster, the pattern and extent of damage, the stability and resilience of the seed system, and even the ability of farmers to engage in farming or not (see parts A.1 and A.2 of Section 5, on decision trees).

Despite marked variability in context, analysis of many disasters over the years suggests some broader patterns in seed security stress, associated with disaster type (e.g., drought, flood, plant disease). Drought, for example, generally seems to have more predictable (and milder) negative consequences for seed security than almost every other shock or stress. Some of these associations are set out in Table 4. For seed security work specifically in conflict areas, practitioners might refer to a new manual that analyzes the effects of different kinds of conflict on seed security, and explores options for diverse interventions depending on the seed security constraint (Sperling et al., 2022).

Different shocks and stresses impact seed security in different ways. Understanding these different disasters and their impact on seed systems is important for designing effective interventions.



Photo: Ezra Millstein/Mercy Corps

**Table 4 Linking disaster type with specific seed security problems: field insights from Africa**

Disaster	Features with potential to undermine seed security	Seed security constraints most often uncovered	Insights from field experience
<b>Drought</b>	<p>Harvests may be lower than usual but only in rare cases will there be total crop failure.</p> <p>Seed sharing may decrease due to seed scarcity.</p> <p>There may be asset sales due to low harvest.</p>	<p>Access problem: some depletion of farmer assets.</p>	<p>Droughts are by far the most common trigger justifying DSD, particularly in southern Africa. However, evidence from the field shows that even with sharp declines in harvests, enough seed for planting is usually available, both from home production and markets. This availability is typical of drought-prone areas where small-seeded crops such as sorghum or pearl millet predominate.</p>
<b>Plant Disease</b>	<p>Crop failure may be near total.</p> <p>Local crops and varieties may not be adapted to the disease.</p> <p>Local seed production channels may not be able to immediately provide adapted (resistant) varieties.</p> <p>Seed sharing may decrease due to seed scarcity.</p> <p>There may be asset sales due to low or no harvests.</p>	<p>Quality problems:</p> <p>Varieties no longer produce (problem of variety suitability).</p> <p>Planting material diseased (seed health problem).</p>	<p>The challenge with plant disease is to identify something that will grow under changed production conditions (in contrast to drought, where production conditions are stable). Also, finding enough resistant material may demand widespread seed multiplication efforts.</p> <p>Example: parts of East and Central Africa have been confronting crises and related seed-quality problems since the late 1990s with waves of CMD in cassava and a build-up of root rots in bean crops.</p>
<b>Flood</b>	<p>Harvest failure may be total (crops wiped out).</p> <p>Fields might be significantly damaged or destroyed.</p> <p>There is the possibility of population displacement.</p> <p>Local seed production channels may not be functioning.</p> <p>Social relations generally remain the same but could change if families end up in camps for internally displaced persons (IDPs).</p> <p>Markets, roads, and other infrastructure could be significantly disturbed.</p> <p>There may be significant losses of assets (seed, livestock, houses).</p>	<p>Availability problem likely; also, the required conditions for planting (arable fields) may not be in place.</p> <p>Prime problem might be extensive asset loss.</p>	<p>Problems of seed availability would normally be associated with floods. However, in Mozambique, a highly flood-prone country, the government promoted SVFs and input trade fairs shortly after 2000, moving seed from one agroecological zone to another. That response puts the focus on 'access' constraints.</p> <p>Depending on the source of the flood water, a problem of soil management may need to be addressed before planting.</p>
<b>War</b> Quick onset, short and intense, staggered over zones	<p>Harvests are lower than usual, but only rarely a total failure.</p> <p>Perhaps no forced population displacement, although massive fleeing by some portions of the population.</p> <p>Seed sharing may decrease due to ruptured social relations and seed scarcity.</p> <p>Local seed production channels may or may not be functioning.</p> <p>Security might be compromised, restricting agricultural work or use of public resources such as markets.</p> <p>Asset losses due to small or no harvest (as when fields are abandoned).</p>	<p>Depends on nature of war:</p> <p>Could be problems of availability and access, or neither.</p> <p>Issues of protection could be key. Does one provide inputs to households if this might put them in danger? Can aid recipients congregate and/or travel to aid hubs?</p>	<p>Seed security problems encountered greatly depend on the specifics of conflict (onset, duration, extent, intensity).</p> <p>Consider Rwanda in the early to mid-1990s (also Box 1). Before war and genocide, many farmers had come to rely on formal sector channels for clean potato seed and new varieties. These arrangements broke down early in the conflict as government services retrenched and development projects pulled out.</p> <p>In contrast, local markets, the main source of beans, continued to diffuse bean seed during some of the worst events. So while potato seed production virtually collapsed, bean seed channels, continued on course for the most part.</p> <p>In the case of potatoes, there was a seed availability problem. For bean seed, the constraint was solely access.</p>

Source: modified from Sperling, 2008

## 4 Implementation: response interventions and guidelines for good practice

This section explores seed security responses and their implementation. The first subsection summarizes the current and more common types of intervention, with the second heralding emerging market-based responses (used less frequently but with the potential for greater effectiveness). The third subsection presents guiding principles for good implementation practice in seed security response, no matter what the intervention. A last subsection shares some actual implementation mistakes (bloopers) to suggest that implementation can go off-course: we need processes to learn from such errors, as well as from success.

A first strong cautionary note is in order here: If you cannot get seed into farmers' hands on time, during their normal sowing period, then STOP. Consider non-seed options for assistance.

### 4.1 Main types of seed security interventions

There are a range of seed-related interventions for use in emergencies. The major approaches are listed and described in Table 4 under three categories: **direct distribution**; **market-based support to clients** (farmers, recipients, beneficiaries); and **market-based support to suppliers**. Market-based responses also include facilitating a more supportive enabling environment (these are discussed further in subsection 4.2). References for more detailed descriptions and handbooks on the main response types are listed in Key Resources.

Some approaches have a long history of use, like direct seed distribution (DSD). Others are relatively new, especially the market-based approaches. Some are also associated with specific implementers. For example, the World Food Programme (WFP) has been closely tied to the 'seed protection ration' response; and Catholic Relief Services (CRS) spearheaded the original work on seed vouchers and fairs (SVF) and its newer variant, Diversity in Nutrition and Resilience (DiNER) fairs. Governments and research agencies involved in emergency programs have been associated with the diffusion of modern varieties to stressed areas (see Table 5 for approach descriptions).

Most seed security interventions still tie emergency aid to formal seed sector support. This practice persists even though smallholders rely mainly on informal systems in normal times, but especially in periods of stress. While the humanitarian community is moving beyond practitioners simply aiming to 'procure some seed' and then 'deliver it' – the essence of DSD – most seed security interventions still are linked only to formal channels. One reason for the continued reliance on leveraging formal channels for seed aid is the issue of seed quality. Many donors, governments, and implementers require certified seed or quality-declared seed (QDS), which practically translates into promoting seed only from the formal sector. This requirement, which may be rooted in generalizations about the quality of seed from the informal sector, greatly restricts the types of crops and varieties made available to stressed farmers. (See Appendix I and subsection 4.2 on market-based interventions.)

If you can't get seed into farmers hands on time, then STOP! Consider non-seed options for assistance.



contents

### Direct seed distribution (DSD)



Photo: Stephen Walsh/USAID

### Seed Vouchers and Fairs (SVF)



Photo: Stephen Walsh/USAID

### Cash transfer for seed

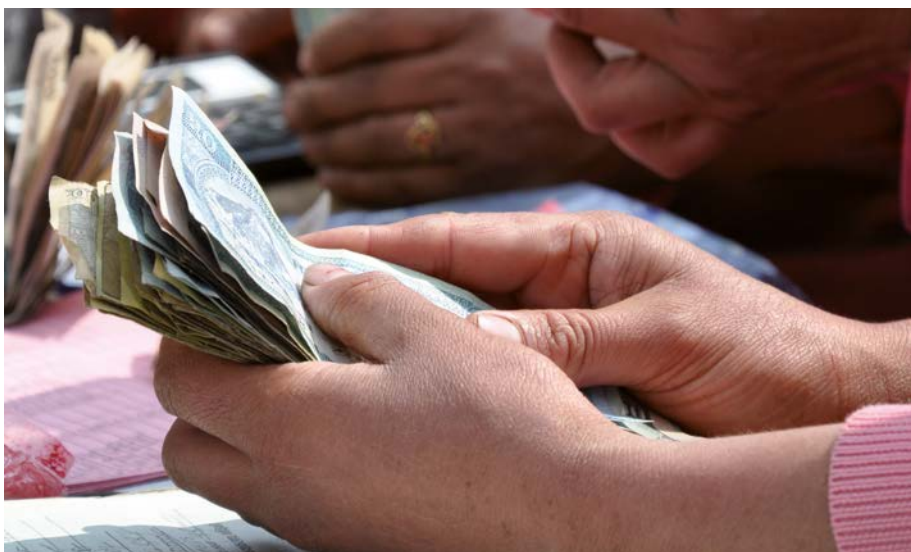


Photo: A. Mottram/Mercy Corps

**Table 5 Most common types of seed security interventions**

Approach	Description/ Rationale	Comment/ Constraint	Strengths	Weaknesses
<b>A Direct distribution</b>				
Direct Seed Distribution (DSD), also known as: Emergency seed provision Seeds and tools	Procurement of quality seed from <i>outside</i> the agroecological region for delivery to farmers.	The oldest and most prominent type of seed relief Assumes the main constraint is seed availability.	Familiar to donors, beneficiaries, and implementers Can reach large populations Can control initial seed quality if seed certification procedures have been respected.	Crops and varieties on offer may not be those most suited to addressing stress. Can undermine markets, both local and formal. Can have challenging logistics, in terms of procurement, transport, and storage (which often makes seed delivery late). Limits farmers' choice and ability to strategize. If done repeatedly, can alter local crop and diversity profiles.
Local procurement and distribution of seed	Procurement of quality seed from <i>within</i> the agroecological region for delivery to farmers. A variant of DSD.	Assumes the main constraint is access (as seed can be procured from within a region).	As above with classic DSD: Familiar. Logistically easy. Can reach large populations. Plus: Seed is likely to be adapted and accepted.	As above with classic DSD: Can undermine markets, both local and formal Limits farmers' choice and ability to strategize Plus: seed quality may be uneven as local procurement often involves sourcing from informal as well as formal seed channels.
Provision of modern varieties	Procurement of quality seed and modern varieties for direct delivery to farmers. A variant of DSD.	Assumes the constraint is variety quality. Also assumes that farmers cannot access modern varieties themselves (without aid).	Gives farmers access to modern varieties that may not be locally available or affordable. Can target specific constraints (e.g., drought, nutrition deficiency).	Risky for farmers, if varieties are not adapted, farmer-accepted or manageable under farmers' own planting conditions. Distribution can undermine commercial sales of these same varieties.
Food aid to serve as 'Seed protection ration'	Extra food aid supplied during an emergency so that farm families do not consume the seed aid provided or their remaining seed stocks.	An approach mainly associated with the World Food Programme Assumes farmers are under high stress and would eat their seed stocks unless given more food.	Logistically easy Adds more food ration to existing food aid.	Hard to verify whether approach addresses or solves a real problem (evidence lacking).

Approach	Description/ Rationale	Comment/ Constraint	Strengths	Weaknesses
<b>B Market-based approaches focused on clients (demand) (see also Table 6)</b>				
Seed fairs, combined with vouchers given to farmers	Fairs provide an ad hoc marketplace where farmers can access seed of different crops and varieties.  Usually in conjunction with vouchers to give farmers more purchasing power.	The second major form of seed relief.  A variant is the Diversity for Nutrition for Enhanced Resilience (DiNER) fair which is actively planned to promote a wide range of crops and varieties.  Other variants are 'livelihood fairs' or 'input trade fairs' that focus on seed plus other inputs such as small animals, trees, and fertilizer.	Provides farmers with choice of crop and variety.  Can put diversity of crops and varieties on offer (if suppliers are offering a range of planting material).  Injects funds into local economy.  Can be important venue for sharing and exchanging information.  Often supports smaller as well as large sellers, women and men.	Labor-intensive in organization and implementation.  Relatively high implementation costs.  Requires focused seed quality control and screening measures, including on-site.  Can reach only relatively small numbers of farmers (compared with DSD).  Not suitable for contexts where people should not congregate (e.g., insecure location, or COVID-type restrictions).
Cash	Cash provided directly or via digital transfer to give farmers more purchasing power.	Assumes the main constraint is seed access.  Assumes that there are seed suppliers in the locality with capacity to respond to the demand.	Lets farmers determine priorities.  Injects money into local economy by supporting vendors selling locally.  Can be done face-to-face or using digital or mobile money.  Has potential to bolster all seed systems farmers use, informal and formal.	May not be used to buy seed as farmers may have other priorities.  Might be used unproductively (e.g., men buying alcohol).  Requires sufficient market insight to ensure that sufficient seed of good quality and the right varieties are available in the locality.  Sometimes tied to other commitments (e.g., work programs) that increase labor loads.  Male and female farmers might not have equal access to digital or mobile money.
Vouchers	Vouchers provided physically or via digital means (an e-voucher), to give farmers more purchasing power.	Assumes main constraint is seed access  The voucher can be linked either to formal seed sector suppliers (agrodealers) or to informal suppliers, such as farmer-sellers at fairs.	Allows farmers to strategize about what they want among the seed options on offer  Injects money into local economy by supporting vendors selling locally.  In contrast to cash, makes it harder for recipients to use the benefit antisocially (e.g., for alcohol or drugs).  Can facilitate monitoring of programs.	Vouchers may lead to artificially inflated prices  If informal supplier, additional seed quality screening may arise as an issue. May also make it difficult for relief agencies to create formal agreement with informal suppliers for voucher-based transaction.  Voucher forgery is a potential risk – this should be addressed through voucher design.



Approach	Description/ Rationale	Comment/ Constraint	Strengths	Weaknesses
<b>C Market-based approaches focused on suppliers (see also Table 6)</b>				
Market-based support to supply side (agrodealers/traders).	Punctual seed multiplication may be commissioned in advance of sowing for relief purchases. Support most often given to formal sector multipliers, although attention to informal suppliers is increasing.	Only in limited use in seed relief. Assumes a seed availability problem. Used especially in multiplication of vegetatively propagated crops (VPCs) like sweet potato.	Supports existing markets, formal or informal, depending on the response design. Injects money into the local economy.	May spur artificial markets, as with sweet potato vine multiplication, for instance, that has no real market beyond relief Depending on supply type, may have issues with crop and variety suitability (especially with formal supplier) or seed health (especially with informal supply).

Sources: modified from Harvey, 2005; Sperling and Cooper, 2004; Sperling et al., 2008; SEADS, 2022

Note that while Table 5 presents the intervention types as discrete, the responses might be mixed – that is, using multiple response types and sometimes differing by crop and seed type (see Box 8).

### **Box 8** Mixing modalities and expanding options in response to interventions

In 2018, CRS and its implementing partners provided emergency agriculture support for seed access utilizing mixed modalities: cash, voucher, and direct seed distribution (DSD). The planned mixed modality provided commodity vouchers for main crops plus a complementary cash transfer to purchase nutritionally dense crop seeds (e.g., kale, beans). The balance of modalities helped to guide crop choices. The project was implemented in 19 districts ('woredas') across the two regions of Oromia and Southern Nations, Nationalities and Peoples' Region of Ethiopia, targeting a total of 42,467 farmers who were impacted by drought and other natural hazards in the previous season.

The project was intentionally designed to transition from direct seed distribution approaches of its previous projects in the area, as was recommended by the Seed System Security Assessment (SSSA), and to test cash and commodity vouchers. Based on the local context (both attitudes toward cash and seed availability), partners conducted rapid assessments which included information on local availability, preferences, seed price, and average landholding. These assessments informed the type and amount of seed to be supported per household. For some of the five partners,

the cash intervention was new, while for others it was not. Changing the delivery model of the program necessitated partner staff buy-in and capacity building. The mixed modality approach for seed provision and the flexibility to change modalities as needed in the context was appreciated by the partners.

Participating farmers also appreciated the mixed modality approach. The direct distribution provided increased access to modern varieties and certified seeds from the formal sector for the main crop production that farmers would otherwise have been unable to access locally and unable to afford. The cash provided households with flexibility to buy other crop types for household consumption and more empowerment to women to decide how to spend the cash so as to contribute to household livelihoods. Post distribution discussions indicated that households bought some crop seeds (e.g., kale and cabbage), and in some cases, also bought other inputs such as hens for egg production. Although partners provided information to participants on the purpose of the transfer, ultimately participants could choose how to prioritize their use of the cash.

Weatherall, 2019

## 4.2 Market-based approaches to seed security interventions

Market-based approaches to seed security have grown in recent years among humanitarian practitioners because of their potential to inject significant funds into local economies in times of stress. For seed security work, market-based assistance also promotes the functioning of multiple sources of planting material over the longer term, and ensures markets, whether formal or informal (see Box 9), are not undermined by large external seed distributions.

Even during emergencies, it is rare for all markets to collapse. Local ones tend to be resilient and to rebound. Not only do people often find new economic outlets, they usually depend on their markets, social networks, and local support systems more than they depend on external aid. As with all market systems, seed market systems (both formal and informal) are complex systems of market-supporting functions including transportation, information services, financial services, and infrastructure as well as components of the enabling environment, such as social norms and regulations. Shocks and stresses can impact and disrupt actors at all these levels and market actors may struggle to cope and recover just as farmers do, further disrupting market functions. Nevertheless, local market actors are also among the quickest to adapt to meet vulnerable populations' needs (Mercy Corps, 2018). For example, a multi-agency market assessment in northeast Nigeria found that some traders in conflict-prone areas could quickly identify which marketplaces were open and closed, obtaining special permits, and negotiating with security forces and local leaders for safe transport of food (Mercy Corps, 2017).

Rarely do all markets collapse in emergencies. Local ones tend to be resilient and rebound.

### Box 9 Informal and formal seed markets



Local markets: cereals, many legumes, other crops.  
Photo: Louise Sperling/SeedSystem

Formal markets include seed companies and agrodealer shops, have specialized buildings and businesses, and sell certified seed of crops like maize and vegetables, as well as fertilizer, pesticides, and tools.

Local markets refer to the many decentralized, typically open-air venues, where farmers buy or trade an array of basic supplies, including fresh or processed foods, grain for cooking, and local seed. For the non-specialist, identifying local seed in these markets may be a challenge as it is usually not labeled or packaged. Farmers, however, are able to pinpoint what they need or want. Scouting among market stalls and baskets, farmers may seek specific



Formal market: agrodealer maize/vegetable seed.  
Photo: Ezra Millstein/Mercy Corps

varieties, seek planting material from specific zones, and will inspect what's on offer, looking for well-filled grains, not discolored or broken. They may even directly ask the seller for 'seed' (Sperling and McGuire, 2010; Sperling et al., 2021).

Local markets provide the lion's share of seed sown by farmers, over 50%, and put on offer a great diversity of crops, an essential ingredient of farm resilience. Formal markets provide less than 3% of total seed but are important for specialty crops such as hybrid maize and for many vegetable crops.

Sources: Sperling and McGuire, 2010; Sperling et al., 2021

Traditionally, market interventions in humanitarian contexts have focused mostly on the client or demand side. Support has been geared to increasing farmers' buying power in the form of vouchers, vouchers combined with fairs, and, more recently, cash to farmers (interventions described above in section 4.1). Support to the supply side, however, has been much more limited, and has generally focused on the formal seed sector. Interventions here have been geared especially towards timely seed multiplication and commissioning of bulk seed orders to be used for relief purchases. Informal markets have not received much seed-related support due to a lack of appreciation of the great importance of such markets as a seed source for farmers and a perceived challenge of distinguishing between grain and seed. Such challenges should be addressed overtly, especially because of the needs of the vulnerable, who use local markets more liberally and who receive aid time and again. A rare case below describes a supply-side informal market intervention: traders being supported to raise seed quality in advance of an SVF (Box 10).

Market-based interventions have the potential to address all four seed security features.

**Box 10 Ethiopian trader raising seed quality standards in advance of SVF**

Seed/grain traders can be partners in improving seed quality. Indeed, quality-related interventions have had promising results in West Hararghe, Ethiopia. From roughly 2002-2006, those supplying CARE's relief seed program in Asebe Teferi were required to have a trading license, separate out varieties, have a warehouse, and maintain specific seed stores that were clean and free of insects.

CARE also trained traders in seed quality issues, apparently withdrawing contracts from those who delivered substandard material. Such awareness raising, capacity building, and monetary incentives might be used to encourage gradual seed/grain quality improvements in other regions.

Source: Sperling and McGuire, 2010

One of the advantages cash transfers and vouchers have over direct in-kind distribution is that they can inject cash into the local economy. However, those strategies on their own provide short-term benefits to a relatively small number of recipients rather than supporting markets to deliver resources to larger numbers of people over a longer period of time. Market-based initiatives target essential market functions, businesses, and institutions, which have more reach and impact than typical aid-driven, recipient-focused interventions. If applied correctly, market-based strategies can improve the capacity of markets to provide farmers and households with critical benefits, such as seed, basic services, and credit, with greater reach and adaptability than humanitarian agencies can achieve directly. Market-based interventions can range from direct financial support to businesses, such as cash transfers or co-investments to re-stock seed supplies (Box 11), to more indirect interventions like helping traders build supply relationships, increase access to seed storage practices, and improve transportation infrastructure (Mercy Corps, 2018). Whatever the interventions, it is important that programs, as 'facilitators of systemic change', work to make sure that new practices remain in the system. This entails understanding which market actors (including public actors and civil society organizations) have the strongest interest in continuing to provide and disseminate practices and in coming up with business models that guarantee sustainability.

### Box 11 Working through markets to support coping in South Sudan

In 2015, a market assessment in Panyijar, South Sudan, found that food drops by the WFP were harming traders' fragile businesses, with negative consequences for consumers. Households were selling food they did not want in local markets in order to buy goods they needed more, including potential items such as local seed (Altai Consulting, 2015). In response to an assessment that showed the negative impact of in-kind aid on local markets, Mercy Corps designed a program to assist both households and traders with cash transfers. The program provided

households with monthly unconditional cash transfers over seven months to access the goods they preferred through the market. The program matched this with three months of cash transfers to a number of cash-strapped traders, helping them replenish stock and meet increased demand. The program's evaluation showed greater increases in sales revenue for supported traders (75% vs <10% for non-supported traders) along with increased supply of food in markets.

Source: Mercy Corps, 2018

It is important that targeted market-based support be provided after an assessment of the local context, through an SSSA and/or a Market Systems Analysis (MSA) – for example, the Emergency Market Mapping and Analysis (EMMA) tool that clearly identifies opportunities for the specific context. It is also important to consider challenges and limitations of a market-based approach such as pairing interventions with efforts to improve social safety nets, identifying who controls resources in markets, and understanding gender and age dynamics. Finally, investments to ensure availability and access to quality seed through markets may take time; in emergency settings, then, it is critical that aid providers combine these market-based approaches and investments with urgent life-saving activities through direct intervention.

Table 6 provides options for different types of market-based interventions in formal and informal seed systems, during crises and beyond. The table has been organized according to the seed security framework around four features: availability, access, seed health, and variety suitability, with two-way information systems added. A few aspects of the table are of particular note. First, market-based interventions have the potential to address all four seed security features. While they are currently linked mostly to seed availability and farmer access, they could be more extensively used to address seed quality issues. Second, while market approaches have so far concentrated on seed, they could be used to improve other market functions such as storage, use of seed treatments, and provision of better information (including feedback systems). Finally, there is a range of opportunities for working on market-based approaches to reinforce informal seed systems, even during emergency periods.



Photo: Tanya Stathers/NRI

**Table 6 Market-based seed interventions to address specific seed security problems**

Seed security feature	Market-based intervention (demand side)	Market-based intervention (supply side)	
		Formal seed sector	Informal seed sector
<p><b>Availability</b> Sufficient quantity of seed of adapted crops is within reasonable distance of farms (spatial availability) and in time for critical sowing periods (temporal availability).</p>	<p>Link farmers to sources of stress tolerant crops and varieties. Facilitate improved farmer storage to save seed for the following season, e.g., access to information services on how to improve storage, and linkages between farmers and hermetic storage bag suppliers/producers. Facilitate flow of information on crops/varieties to farmers (information services from traders to farmers).</p>	<p>Facilitate increased seed availability in target areas by agrodealers, e.g., enable traders to replenish stocks and move higher volumes. Facilitate linkages between traders and financial institutions; incentivize financial institutions to loan to traders. Cash transfers to agrodealers.</p>	<p>Facilitate increased availability of seed in target areas by market traders, e.g., improve transport to move supplies to remote areas (addresses both availability and access). Cash transfers to market traders. Support local traders' association to negotiate improved transit fees. Facilitate linkages between traders and financial institutions; incentivize financial institutions to loan to traders.</p>
<p><b>Access</b> Diverse groups of people have adequate income or other resources to purchase or barter for appropriate seeds and have physical access to multiple seed sources.</p>	<p>Facilitate seed purchases by farmers and farmer groups. Link farmers to multiple sources of stress-tolerant crops and varieties. Facilitate transport access. Conditional cash; unconditional cash; cash plus vouchers.</p>	<p>Facilitate production and sale of small seed packets by agrodealers. Transport vouchers to formal sellers, to move supplies to remote areas, addressing both availability and access. Capital advances to formal sellers/loans.</p>	<p>Transport vouchers to traders, to move supplies to remote areas, addressing both availability and access. Capital advances to traders/loans.</p>
<p><b>Quality: Seed health</b> Seed is healthy: good physical, physiological, and sanitary quality.</p>	<p>Facilitate access to information and training on seed selection, storage, and quality testing. Facilitate access to seed storage services and facilities at the community level.</p>	<p>Facilitate improved seed certification and quality at the seed trader and regulatory environment level. Facilitate improved seed storage facilities, or PICS (hermetic storage bag) use at the agrodealer/trader level.</p>	<p>Facilitate improved seed storage facilities, or PICS (hermetic storage bag) use at the trader level. Facilitate trader knowledge on germination testing to check quality. Facilitate trader knowledge of different seed qualities: certified, QDS.</p>
<p><b>Quality: Crop and variety suitability</b> Varieties are adapted to local conditions, are gender-sensitive, and have market demand</p>	<p>Ensure farmers have diverse variety knowledge, e.g. Information systems to help farmers learn about stress-tolerant varieties and crops .</p>	<p>Facilitate formal seller links to research institutes. Facilitate agrodealers to expand their reach of modern varieties to focus areas – this might involve alleviating transport gaps, de-risking expansion to new areas.. Cash tied to agrodealers for new/introduced crops/varieties. Cash tied to agrodealers for crops/varieties farmers know</p>	<p>Facilitate movement of diverse and/or new varieties by traders (may be linked to information systems, improved connections with formal markets/breeding centers, and skill enhancement). Ensure traders can distinguish among varieties and keep stocks separate (skill enhancement). Link lead farmers to research institutes. Facilitate participatory plant breeding..</p>
<p><b>Access to information via media and broadcasting</b> Farmer to trader, trader to farmer, farmer to farmer, trader to trader, etc.</p>	<p>Mobile SMS cards/cash.</p>	<p>Cash for radio announcements/SMS Information systems to train traders.</p>	

Sources: Modified from: Keane et al., 2019; Sperling, 2019; Walsh and Sperling, 2019

### 4.3 Ten guiding principles of good practice

Field experience with the implementation of diverse seed security interventions now spans several decades. From that experience, central guiding principles have emerged to shape good or better practice, regardless of context. Varied multi-platform groups have contributed to global discussions, helping to formulate principles.<sup>4</sup>

The core set of 'guiding principles of good practice' in seed aid has remained relatively constant for 20 years. There have, however, been recent innovations around market-based approaches, along with an expansion of seed aid goals. This latter expansion recognizes that assistance might extend beyond the goal of food security to include better household nutrition and farm resilience. Also, through time, the importance of some of these principles has been further emphasized. The need for evaluation (and different kinds of evaluation) has especially gained prominence as the humanitarian field moves to more evidence-based response choices and evaluation of results.

The SERT lays out 10 guiding principles below together with technical guidance notes. All emergency seed security interventions should follow these principles to shape actions on the ground. Note that gender has been integrated as a cross-cutting concern.

#### **Principle 1 Seed System Security Assessment (SSSA)**

*Where people are at risk of seed insecurity, assessments must be conducted to identify possible seed security problems among the diverse groups affected (e.g., men and women).*

An SSSA should guide a decision to undertake any relief intervention. The assessment helps the humanitarian community to understand whether a seed security intervention is needed at all and, if so, which problem(s) to address (see subsection 3.2). An SSSA should guide a decision to undertake any relief intervention. The assessment helps the humanitarian community to understand whether a seed security intervention is needed at all and, if so, which problem(s) to address (see subsection 3.2).

#### **Technical notes**

- **Types of seed security stress** The key features of seed security – availability, access, seed health, and variety suitability – each need to be assessed. In situations of stress, it is rare to have constraints in all four seed security features at the same time. The challenge is to identify the driving problem(s).
- **Minimum standards** A set of standards for SSSA defines the minimum information needed to ensure basic rigor and holistic analysis. (See Appendix 2 and [seedssystem.org/article/minimum-technical-standards-for-seed-system-assessment-ssa-in-emergencies/](https://seedssystem.org/article/minimum-technical-standards-for-seed-system-assessment-ssa-in-emergencies/).)
- **Demand and supply sides** Any assessment should include analysis of the demand (farmer) and supply sides and, where possible, additional market system information such as regulatory norms. Attention should be given to

<sup>4</sup> FAO put better practice front and center in a seminal conference in 2003 (FAO, 2004). More recently, the SEADS humanitarian guide has suggested some 'standards' that span interventions (SEADS, 2022). The SeedSystem/Mercy Corps/ISSD groups have drawn on this prior work and modified and expanded both sets (ISSD/Mercy Corps/SeedSystem consultations, 2021/2022).

The SERT lays out 10 guiding principles together with technical guidance notes. All emergency seed security interventions should follow these principles to shape actions on the ground.

analyzing differential demand (women vs men; farmers of varying wealth and land area).

- **All key seed channels** Farmers often decide to use multiple channels to procure their seed, out of necessity, cost-benefit considerations, and preference (subsection 2.1). These channels may differ by crop. For instance, vegetable seed may be sourced from an agro-dealer and sorghum from farmers' own stocks or from neighbors. Farmers might also shift use of channels in times of stress, filling gaps with seed from local markets if farmers' own stocks or harvests run low. It is important to assess how all these channels function together. A common mistake is to assess supply only from the formal sector channels (government and commercial seed companies). This sole focus ignores the contributions of the other seed channels, including those that may be especially important in stress periods or for the poorest.
- **Main crops for upcoming season** Seed supply for the multiple key crops needs to be assessed, with a focus on the immediate next season(s) and on the crops considered essential. Supply has to be assessed crop by crop as seed sources may differ by crop, just as the effects of disaster on different sources may vary, e.g., local markets may be resilient while agro-dealers are compromised (Box 1).
- **Acute vs chronic stress** Acute and chronic seed insecurity often exist together in stressed contexts (subsection 3.2). Indeed, in cases where short-term emergencies recur – in drought-prone areas, for example – acute problems are often superimposed on chronic problems rooted in poverty and poorly functioning systems. Practitioners need to be aware of the nature of both the acute and chronic stresses and **differentiate between them**. Also, practitioners should work on the short-term response in ways that do not further contribute to longer-term stress, for example, repeatedly distributing free seed in ways that may undermine functioning markets (Principle 6).



Photo: Georgina Smith/PABRA

## Principle 2 Response type

*The type of response chosen should address the type of seed security problem(s) identified.*

The response chosen should aim to alleviate the seed security problem(s) identified. For example, if seed availability is assessed as a problem, seed-based interventions such as direct distribution may be appropriate. If seed access proves a problem, interventions might involve cash or voucher-based responses that also give female farmers and marginalized communities more buying power (see Tables 4 and 5).

### Technical notes

- **Blanket response** Practitioners need to be cautious (and review their assessments) if they are using only a single response type in all contexts to address a range of seed security problems. The problems can be quite nuanced, by geographic location, agroecological zone, crop, season, even gender.
- **Repeated response over seasons** If in a single context practitioners are implementing the same response season after season, they need to review the identification of the seed security problem, especially as to whether it is acute or chronic. Repeated responses can damage farming system resilience.

- **Calculations of amount of aid needed** Direct aid calculations need to be based on farmers' realistic sowing rates, not recommended ones. Also, calculations need to tally the seed or funds farmers already can access. It is relatively rare that 100% of seed or seed funds are needed.

### Principle 3 Goal of the intervention

*The seed security intervention should be designed to meet a clear goal.*

Diverse overall goals shape the type of seed security to be achieved, whether these goals are explicitly stated or not. These goals need to be made clear to farmers and transparently defined (see Table 2 for a range of goals and detail on how specific goals shape intervention design).

#### Technical notes

- **Diversity of goals** Increasingly, seed assistance moves beyond the generic goal of farmers having enough seed for basic production. Depending on farmers' needs, a goal of seed security assistance might also be to bolster household nutrition, family income, and/or farming systems resilience.
- **Farmer priorities (including in stressed periods)** Goals must meet farmers' immediate needs, not implementers' desires.

### Principle 4 Context

*The type of response chosen can actually be implemented in the given context and adheres to the 'do no harm' principle.*

Seed interventions have to be matched to the context. The modes of operation required in a crisis caused by drought, for example, may differ significantly from those required in a crisis caused by war (see Table 6 and Sperling et al., 2022). In the local context, gender and social exclusion practices must be considered.

#### Technical notes

- **Multiple viewpoints considered in context analysis** The feasibility of working in a context and with a given response has to be analyzed from multiple viewpoints – minimally, those of the farming community and those of the practitioners.
- **Push and pull factors** To ensure that interventions 'do no harm', seed activities in emergency settings must be demand-driven (pull factor). Practitioners must be careful to consider whether there is potential for seed provision to act as a push factor, for example to encourage displaced populations to return to farming before the risk is removed or before they are fully comfortable doing so. This might be true in areas of conflict or with active landmines, where seed is included in return packages.

### Principle 5 Timeliness

*Any intervention proposed can be completed in time for farmers to have seed in hand for their normal planting period.*

Late planting of seed can compromise production results and wastes farmers' land and labor. Any intervention must respect local sowing cycles. Late seed aid is simply bad seed aid (see Box 12 for an indicative timeline of DSD).



Photo: Cassandra Nelson/Mercy Corps:



## Technical notes

- **Farmer planting schedules** Farmers may plant over a period of weeks, even staggering sowing according to rains or access to fields, or other concerns. Practitioners should aim to get seed into farmers' hands (not just at a depot) as soon as possible before or during early sowing windows.
- **Common bottlenecks** Common bottlenecks for each type of intervention might be mapped out and anticipated. For example, for DSD, there are often problems with contract delays, seed quality checks, import permits. For voucher programs, frequent bottlenecks arise with printing processes and screening enough vendors.

### Box 12 Direct seed distribution (DSD) timeline

A DSD timeline varies, and depends on considerations such as whether seed is available locally or outsourced, whether it is certified, the quality desired by the organization, the volume to be procured, and the type of distributions planned.

The specific logistics can be formidable and the timeline must include time for quality assurance, transport, potential repackaging, and delivery to the many points of distribution. Note that seed delivery may also compete for resources like fuel and secure storage with other assistance like food.

The steps in the process generally include:

- 1 market survey and identification of vendors,
- 2 setting up agreements with vendors,
- 3 signing agreements on supply modalities,
- 4 receiving seed supply, and
- 5 dissemination to participants.

A typical timeline covers 8 to 10 weeks, but can be much longer.

## Principle 6 Market-based assistance

*Humanitarian assistance should support, not undermine, critical market functions.*

Market-based assistance should be given priority if the approach can also address the seed security constraint identified. Market-based assistance has the potential to deliver immediate assistance to farmers while encouraging longer term functioning of regularly used markets (see subsection 4.2).

## Technical notes

- **Facilitate interventions that target both supply and demand sides** If appropriate, practitioners might consider market support to the demand side (e.g., increasing farmers' purchasing power) and to the supply side (e.g., selecting, informing, and supporting seed sellers). See Table 5.
- **Informal and formal seed markets** Practitioners might consider assistance support to all the markets farmers use: formal, informal, and intermediary. Much depends on whether markets are functioning and on the specific crops and varieties in question.
- **Key market actors** It is important to identify and understand key seed-related actors. Agro-dealers are an obvious choice, but there are different types of actors that also play important market functions – for example, a woman selling local varieties of vegetables, and traders moving large quantities of adapted local seed into areas of high demand.
- **Additional market functions** Other market systems functions should also be assessed, such as information services and infrastructure. For example, are cell phones common, working, also used by women farmers... which might allow for mobile vouchers?

- **Rules and norms** Informal rules and norms, standards, and regulations should also be understood. Where appropriate, interventions should be designed to fill gaps or influence changes that improve the efficiency of seed systems during the time of emergency and beyond.

## Principle 7 Crop and variety choice

*The crops and varieties selected for the intervention should suit the context and user needs.*

The crops and varieties linked to any intervention need to be suitable on many fronts. They should be adapted, usable under farmers' management conditions, tolerant of major stresses, and deemed acceptable by diverse groups of farmers, with attention given to female and male preferences.

### Technical notes

- **Seed and intervention goal** The crops and varieties put on offer should align with intervention goals (Principle 3).
- **Traditional versus modern varieties.** Varieties put on offer may be traditional (local) or modern ('improved'), depending on farmers' needs and wants, and farmers' prior experience with the varieties. In an emergency intervention, it is risky (and poor practice) to introduce varieties that have not been previously tested in an area, with farmer participation and feedback. Risk minimization procedures need to be followed (see the decision tree on variety suitability, in Section 5).
- **Varietal preferences, including those related to gender** At a minimum, analysis of farmers' preferred varietal traits needs to include focus on consumption traits (like taste and cooking time), processing, and marketability. Women and men sometimes assess priority traits differently, with women often emphasizing household needs and men focusing on traits needed for the market.
- **Crop preferences, including those related to gender** Crop choice needs to be guided by an understanding of possible gendered management, use, and control of crops (see Boxes 6 and 11).
- **Realistic management conditions** Crops and varieties should be shown to perform well under routine and realistic farmer management conditions, not only under ideal growing conditions with inputs. Note that actual farmer practices (e.g., sowing rates and input use) may be very different from the official recommended ones.
- **Self- and open-pollinated varieties** These are often preferred for emergency operations because farmers can save the seed from the harvest to plant the following season. Hybrid varieties are generally not recommended for emergency operations as farmers have to buy seed again if they wish to continue sowing the crop. Hybrids should be considered only where stressed farmers have considerable prior experience with hybrids and explicitly want them.
- **Genetically modified organisms (GMOs)** The presence of any GMOs must be declared to national and local authorities and to farmers. GMOs should be provided only if they are sanctioned legally and if there is prior informed consent and expressed interest for using them, including among farmers.



Photo: Georgina Smith/PABRA

- **No suitability, no intervention** If adapted and preferred crops and varieties cannot be made available, practitioners should abandon any plans for a seed-linked intervention and find other ways to support vulnerable farmers.

## Principle 8 Seed quality

*The quality of the seed involved in the intervention must meet the minimum standards of farming communities, practitioners, and donor organizations.*

At a minimum, donors and practitioners want to ensure that the seed aid product does not cause harm. Two seed quality issues are paramount. Is the seed quality sufficient to give a reliable production result? Is the seed free of pathogens that could cause disease to spread?

### Technical notes

- **Seed quality** The term ‘seed quality’ has three aspects: physical quality, physiological quality, and seed health. See the glossary and Appendix 1 for specific measures of seed quality.
- **Vegetative planting material** While seed quality concerns are important for all crop types, they are of special importance for the cluster known as vegetatively propagated crops (VPCs). For these crops, the sowing material is not a grain but rather a vegetative part of the plant (stem, root, vine or sucker) or, in the case of trees, a sapling. A primary concern during emergency aid operations is that pests and diseases might be present, on or in the living tissue, and could be transmitted to other areas. Diseased plants can potentially infect not only the aid crop, but other species as well. VPCs are also susceptible to rapid degradation during transport.
- **Avoiding stereotypes** Implementers most often define quality according to the formal sector definition and equate quality with certified seed. This tendency stems from the requirements of donors and procurement departments to show evidence of formal sector seed certification when purchasing seed for distribution as aid. Note that certified seed is not necessarily of good quality (especially once it reaches the farmer), whereas farmer-saved seed may be of fine quality.
- **Maintain quality** Seed quality needs to be managed at many stages of the intervention: from procurement, to transport, to storage, to distribution – and other phases. Seed quality can quickly deteriorate if the planting material is not carefully managed.
- **Seed treatments/coating** To enhance performance, seeds may be pre-treated, for example with a fungicide or pesticide coating. And to ensure seed is recognized as distinct from grain, it may have other distinguishing features, such as being colored pink. Farmers need to be made aware of these treatments, including any associated risks. They sometimes sow by mouth and cook seed for food, making seed coated with certain chemicals potentially harmful.
- **Labels** Especially when sourced from formal sources, seed should be labeled so farmers know its name, type, and any special management needs. Labels might also include information on the supplier so farmers can give feedback and address any quality concerns.

‘Seed quality’ has three aspects: physical quality, physiological quality, and seed health.

## Principle 9 Farmers' choice

*Wherever possible, farmers should be able to choose among crop and variety options.*

Not all farmers sow the same set of crops and varieties. Male and female farmers should have the opportunity to plan and tailor assistance to their immediate household needs and overall cropping strategy (see Boxes 13 and 14).

### Technical notes

- **Diverse crops and varieties** Interventions should ensure a range of crops and varieties are available to meet the needs of both more commercial and more subsistence-oriented farmers, men and women, the highly vulnerable, and displaced as well as settled populations.
- **Facilitating access to different seed channels** Allowing farmers to access seed from diverse seed channels (formal as well as informal) often helps to expand the range of choice, e.g., both local and modern varieties, and both indigenous and modern commercial crops.

### Box 13 Give farmers choice

Farmers often adjust their varietal selections to changing conditions during or following a crisis, rather than looking to restore their previous varieties. They often see their crop diversity as dynamic, during normal as well as disaster years.

One compelling example comes from Sierra Leone. In 2002, after nine years of brutal war, CARE offered farmers a range of rice and groundnut varieties, including ones that had previously been scarce. While some farmers did select varieties they had planted the year before or pre-war, a

considerable number sought to try totally new varieties: 56% of those selecting rice and 36% of those selecting groundnuts were 'variety innovators' (Richards et al., 2004; Richards, 2005). Similarly, in Mozambique, from 2000 to 2003, some farmers surviving a flood followed by drought did not want the 'lost' cowpea varieties back, because of their susceptibility to drought (Ferguson, 2003). Hence farmers in crisis may intentionally seek new varieties rather than old ones.

## Principle 10 Feedback at multiple key stages

*Client groups, farmers, and suppliers must have the opportunity to give feedback at the end of the season, and afterwards.*

Practitioners should build monitoring and evaluation mechanisms into the design of the intervention, covering its different phases. See Appendix III for details on evaluation criteria and stages.

### Technical notes

- **Timing of evaluations** It is important to be clear about what feedback and changes might be expected at different stages of an intervention. These should be mapped out at the beginning of the assistance to shape and better monitor what may be unfolding on the ground. Minimally, evaluations should take place immediately after implementation of a seed intervention and at the end of the cropping season. Evaluations several seasons later can give further insight into more enduring positive or negative benefits.
- **Cumulative effects** Practitioners should be aware that the effects of an intervention may be incremental, building on each other. For example, access to a new variety might lead to higher production, to a larger proportion of the harvest being marketed, and, eventually, increased income. Feedback mechanisms need to capture these cascading effects over time.

- **Budgeting** Agencies need to explicitly budget time and resources to monitor and evaluate the effects of their assistance.

#### **Box 14 Gender-based design tenets in seed system programming**

Gender considerations must be an organizing principle of seed system programming. There is an abundance of ‘common knowledge’ of pivotal gender issues in agriculture (World Bank, 2009) and in specific seed systems (Brearley and Kramer, 2020). For example, access to seed is often affected by gender relations, and most emergency programs struggle to enhance women’s access to seed.

Here are several gender responsive design tenets for seed programming:

- Recognize the different needs and preferences of women and men and design appropriate seed delivery models for each.
- Ensure seed provision includes extension programs that benefit women by creating both current learning opportunities for varietal adoption and self-learning opportunities to sustain future adoption and utilization of seed technologies (Pushkur, 2021).
- Ensure quality seed is affordable and accessible to women and that any trade-offs from other seed response options (e.g., subsidy) do not have gender-related negative outcomes, particularly for women.

- Prioritize seed interventions that enhance the knowledge and skills of women by ensuring access to technical resources and complementary inputs and services.
- Tailor seed programming to enhance women’s entrepreneurial capacity to actively participate in program implementation, for example as seed suppliers.
- Design seed programming to provide policy and operational space for formal and informal seed systems – women often engage more in the latter.
- Understand the potential for gender-based violence related to farming and planting decisions, the selling of produce, and the management of income.

Here are a few potential gender differences to consider in designing a seed intervention:

- Women and men may have different varietal preferences.
- Women and men may have control over different crops.
- Fields/plots may be managed differently, according to gender.
- Access to innovations (varieties, seed, knowledge) may be gender biased.
- Delivery mechanisms may be gender skewed.

## 4.4 Learning from mistakes

The field of seed aid is evolving. To better support smallholder farmers, we must continually learn from our responses on the ground. Sometimes a response unfolds well. Other times it does not: implementers confront major bottlenecks or just make outright errors. What’s important is that we learn from constraints and mistakes and set up processes to observe, critique, rethink, and learn.

Below, we present examples of actual mistakes. Collectively, they show that even knowledgeable and well intentioned implementers occasionally commit bloopers or encounter unexpected consequences of their interventions. The examples are shared with the intention of illustrating two simple but important messages. First, when intervening to provide seed-related assistance, proceed with caution! Second, keep your eyes open to the results and be ready to learn from errors as well as successes.

### **A sampling of seed aid bloopers and unexpected outcomes**

- **Rwandan war and sorghum seed** Shortly after the civil war and genocide, an agency distributed sorghum in anticipation of the February–June 1995 growing season. Follow-up showed that a good deal of the seed was brewed into local beer. While the agency was concerned that emergency aid had been transformed into ‘booze’, the beer is actually an important source of calories, provides income, and is even used as a weaning porridge when very diluted. Clearly, aid workers and farmers didn’t have the same priorities.
- **Kenyan drought and maize hybrids** After the 1997 drought, an agency gave priority to maize hybrids in its emergency seed distributions. Most poor Kenyans do not routinely use maize hybrids and they were impressed with its

'specialness' and even 'luxury value,' but not necessarily just for direct sowing. A good number of farmers exchanged the packaged maize for more urgently needed items: salt, sugar, and oil. In this case, seed aid unexpectedly served a currency function.

- **Ethiopian drought and cash for relief** An agency decided to test a new emergency response strategy in a southern area of Ethiopia after the 2003 drought. While they assumed seed was needed, they decided to let farmers decide for themselves and launched a 'cash for relief' program. Follow-up showed that farmers invested nearly all the cash in purchases of livestock (cows and goats), with none of the recipients buying urgently needed seed. Perhaps 'emergency' needs in this instance were actually needs of a long-term nature.
- **Senegalese drought and millet mix-up** Responding to a disaster in Senegal in 2005, a relief agency appropriately focused on the main drought-tolerant cereal crop, pearl millet. The aid distribution unfortunately contained proso millet, not the pearl type. Proso millet, whose seeds are smaller than those of pearl millet, is often used as birdseed or as a health food for those who cannot tolerate gluten. The two types of millet are not only different species but also belong to different genera.
- **Darfur war and seed aid** In 2007, relief groups working in some regions of Darfur responded to seed shortages with direct distributions, since they were concerned that farmers would not want to travel far from their villages to obtain seed due to security risks. However, the farmers who received the seeds identified the varieties and, if unhappy with them, simply headed to the nearest market to exchange the seed aid for their preferred varieties. To international aid workers and local farmers, access to local markets may look quite different.
- **Pakistan potato storage mess (circa 2014)** As part of an emergency distribution of seed potatoes, the supplier provided potatoes in air-tight bags. As this planting material is alive, and (unlike true seeds) cannot be dried to a state of dormancy, seed potatoes will carry on respiring and emit water vapor. But the bags could not 'breathe', so became more damp over time, rotting the seed potatoes inside. Though the implementing agency had specified air-permeable packaging, the supplier did not appreciate the importance of this. This sort of error may only be spotted at the time of delivery, which is too late.
- **Syria, refugees, and the wrong zucchini variety** As part of a package to support income generation among Syrian refugees (2017), an agency decided to include a zucchini variety widely consumed in the country. Unfortunately, when the crop matured, it did not produce the large, elongated fruits as expected, but rather small, rounded fruit. The supplier had mistakenly provided the wrong variety, one which is common in India and Pakistan but which is not known or consumed in Syria. It therefore had no market value. Though the seed quality was verified in a lab before being distributed to farmers, variety identity is usually confirmed in the field as the crop matures. The supplier's mistake could only be discovered then, too late for the farmers.

Even knowledgeable and well intentioned implementers occasionally commit bloopers or encounter unexpected consequences of their interventions.

## 5 Decision trees: choosing among response interventions

The first four sections of this SERT have laid the groundwork for making strategic decisions about choosing and designing interventions for better seed security. That groundwork comprised a short history of seed aid, a review of fundamental elements of seed systems and seed security, the process for identifying constraints on seed security (both acute and chronic), and a listing of good practices for implementing seed security responses. This next technical section moves to the practical task of choosing among response interventions – with the help of decision trees.

### 5.1 Decision trees

Practitioners are now in a strong position to weigh options and make a firm decision among possible seed security choices for the upcoming planting season (so the focus is on acute stress). The decision trees below provide a systematic path to such decisions.

There are many steps and decisions, big and small, to make before implementing a seed security response. The more informed practitioners are of the conditions for an intervention, the possible types, and the steps to choose and implement, the greater the prospects for improving humanitarian seed-related practice. The decision trees presented here should be further refined based on practitioner use and insights.

The decision trees are organized according to the sequence of decisions to be made:

- A** Is a seed security-linked intervention feasible?
- B** Have the broad parameters of a possible seed security intervention been established?
- C** What are the key considerations in choosing a specific seed security response? This subsection is divided into trees that address specific types of seed security features:
  - C1** Seed availability
  - C2** Seed access
  - C3** Seed health
  - C4** Variety suitability

To guide the user, each tree is set out as a series of questions, step by step. Each key question needs to be answered before the user proceeds to the next. If the question can be answered with a 'yes', the practitioner can move to the next step. If the answer is 'No', the practitioner might either stop the intervention or solve the issue that is preventing a 'Yes' answer. Decision making should be guided by concrete evidence. Thus, for each step, the decision tree asks for clear evidence (in column 2) supporting either a 'Yes' or 'No' answer.

These decision trees are detailed mainly because they aim to guide practical application on the ground. They can be used for actual field planning decisions, with teams working through the steps to guide a) whether an intervention should be done, and b) if so, which kind. A clear message that emerges from the use of these decision trees – and from practical field experience – is that there are numerous 'checkpoints' at which a seed security intervention might be stopped. Practitioners need go forward only if the conditions are in place to complete the intervention with competence and in ways that directly meet farmers' needs.





The more informed practitioners are of the conditions for an intervention, the possible types, and the steps to choose and implement, the greater the prospects for improving humanitarian seed-related practice.









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Table 7 Decision Trees


**A Is a seed security-linked intervention feasible?**

Key questions to shape the response	Evidence	If YES	If NO
<b>A1 Readiness</b> Is the farming population ready to engage in agriculture?		<b>Move to A2</b> ▼	Are there other crucial non-agricultural aid options to support the population?
<b>A2 Means</b> Does the population have the means to engage in agriculture (e.g., land, labor, other inputs, credit)?		<b>Move to A3</b> ▼	Can supplementary aid help lessen non-seed constraints? If yes, what kind of supplementary aid? If no, should non-seed aid be given priority?
<b>A3 Broad context</b> Are the major context changes affecting agriculture during this stress period clearly understood?		<b>Move to A4</b> ▼	What additional information processes could be put in place to clarify the situation?
<b>A4 Do-no-harm: general context</b> Can a humanitarian response be implemented in the current scenario? Consider short- and long-term effects.		<b>Move to section B</b> ▼	Can harmful effects be alleviated with altered strategy? Analyze each item in terms of potential harm. If no, consider other non-seed aid.

**B Have the broad parameters of a possible seed security intervention been established?**

Key questions to shape the response	Evidence	If YES	If NO
<b>B1 Assessment</b> Has an adequate assessment (SSSA/SSA) been completed? <ul style="list-style-type: none"> <li>Are the ex ante cropping and seed systems well understood?</li> <li>Has the impact of disaster on specific crop and seed systems been analyzed?</li> </ul>		<b>Move to B2</b> ▼	Can the required information be directly completed or accessed from elsewhere (e.g., another organisation)? If no, do NOT move forward on seed assistance. An assessment is necessary.
<b>B2 Constraints</b> Have specific seed security constraints been identified? Focus on acute stress.		<b>Move to B3</b> ▼	What further information is needed to understand the main constraint? How can data be gathered? Do NOT proceed if the constraints are not clear. An incorrect constraint could be targeted and the real problem not solved.
<b>B3 Goal</b> Have the broad goals of any seed security intervention(s) been set (e.g., resilience, nutrition, income)?		<b>Move to B4</b> ▼	Work with humanitarian staff and communities to set priority goal. Remember that goals shape program design (see Table 2).
<b>B4 Responses tailored to constraint and goal</b> Have a range of responses been put forward that: <ul style="list-style-type: none"> <li>can address the specific seed security constraint/s, and</li> <li>can meet the broad goals?</li> </ul>		<b>Move to B5</b> ▼	Work with technical experts to verify that the response is refined. A blunt, un-tailored response may have either less impact, or a negative impact.
<b>B5 Market-based assistance</b> For responses being considered, has market-based assistance been given serious review? Both formal and informal markets might be considered.		<b>Move to B6</b> ▼	Step back to consider whether market-based options are possible. They may have more sustainable positive effects. If No, justify that conclusion. If Yes, move to informal or formal market sector support.
<b>B6 Do no harm: specific context</b> For each type of response being considered, has a review been done to confirm it can be implemented so as to 'do no harm'?		<b>Move to B7</b> ▼	Conduct a review. If it shows the current proposed response can do harm, consider an alternative. If no alternative response emerges, consider other non-seed responses.










Key questions to shape the response	Evidence	If YES	If NO
<b>B7 Feedback / evaluation</b> <b>For any response being considered, have/will feedback and evaluation mechanisms been/ be built into the proposal?</b> <ul style="list-style-type: none"> <li>This question cuts across all types of response. <ul style="list-style-type: none"> <li>Feedback + feed-forward; real time</li> <li>Multiple stages of evaluation.</li> </ul> </li> </ul>		<b>Move to section C</b> ▼	Return to proposal and add comprehensive feedback and evaluation mechanisms. Donors might have to intervene or reject proposals lacking these elements.

## C Key questions framing choice of specified seed security responses (focus on responses to acute stress).

### C1 responses are linked to **Seed Availability**: key programming questions on **Direct Seed Distribution (DSD)**

A pivotal decision has to be made on whether to aim for a classic DSD, importing seed from outside a region, or for local procurement. The answers to C1.1 to C1.7 should help guide that choice.

Key questions to shape the response	Evidence	If YES	If NO
<b>C1.1 Context</b> <b>Does the context allow for a DSD?</b> <b>Can farmers congregate to receive aid?</b> <b>Can farmers travel to distribution venues?</b>		<b>Move to C1.2</b> ▼	No action. Consider non-seed assistance.
<b>C1.2 Logistics</b> <b>Can the full range of DSD operations be implemented in this context?</b>		<b>Move to C1.3</b> ▼	No action. Consider non-seed assistance.
<b>C1.3 Timeliness</b> <b>Can the DSD operations be completed before farmers' normal planting times?</b>		<b>Move to C1.4</b> ▼	No action. Consider non-seed assistance.
<b>C1.4 Crops</b> <b>Are the right crops available for procurement i.e., farmers' priorities for the upcoming season?</b>		<b>Move to C1.5</b> ▼	Consider whether 'second choice' varieties would be accepted and useful. If Yes, proceed. If No, take no action (stop assistance).
<b>C1.5 Varieties</b> <b>Are the right varieties – adapted and farmer acceptable – available for procurement?</b>		<b>Move to C1.6</b> ▼	Consider whether 'second choice' varieties would be accepted and useful. If Yes, proceed. If No, take no action (stop assistance).
<b>C1.6 Seed quality</b> <b>Is the seed quality on offer at least as good as that of seed farmers routinely use?</b> <b>Is the quality also acceptable to donors, governments, and practitioners?</b>		<b>Move to C1.7</b> ▼	Consider whether the quality standard available would harm farmers. If quality 'okay', proceed. If No, take no action (stop assistance).
<b>C1.7 Farmer choices/options</b> <b>Can farmers be offered choice, that is, diverse crop and variety options that are possible to sow and farmer accepted for upcoming season?</b>		<b>Proceed with action</b> ▼	Consider whether having few or no options is safe and can achieve goals. If Yes, proceed. If No rethink DSD format.
<b>ACTION</b>		<b>Proceed</b>	No action. Consider non-seed assistance to support vulnerable populations.

## C2 responses linked to **Seed Access**: key programming questions

For the constraint of **Seed Access**, there are several possible response options. It is up to the implementing organization to choose among response types.

Key questions	Evidence	Cash	Vouchers	SVF	DSD			
<b>C2.1 Context</b> <b>Does the context allow for this type of intervention?</b>	<div style="border: 1px solid black; padding: 2px;">                     1 ~~~~                      2 ~~~~                      3 ~~~~                      4 ~~~~                 </div>	Are there sufficient market outlets supplying formal or informal seed? Are outlets within reasonable distance? Is it safe/feasible for recipients to travel? Do donors /gov'ts allow for this modality?	Are there sufficient market outlets supplying formal or informal seed? Are outlets within reasonable distance to recipients? Is it safe/feasible for recipients to travel?	Is it safe/feasible for recipients to congregate and travel? Are vendors willing to travel to fair venue?	C.1 above			
		<b>YES</b> ▼	<b>No</b> Review possibility of other interventions that enable seed access and solve constraint(s) directly above.	<b>YES</b> ▼	<b>NO</b> Review safer/more accessible response options (DSD?). Review whether DSD can offer supply needed (linked with C.2 (4,5,6,7)).	<b>YES</b> ▼	<b>NO</b> Review safer /more accessible response options (DSD?). Review whether DSD can offer supply needed (linked with C.2 (4,5,6,7)). If vendor travel is constraint, consider travel subsidy.	
<b>C2.2 Logistics</b> <b>Can the necessary logistics be put in place to implement this approach?</b>	<div style="border: 1px solid black; padding: 2px;">                     1 ~~~~                      2 ~~~~                      3 ~~~~                      4 ~~~~                 </div>	Are either direct or digital transfer of 'cash' options available? Can all recipients including the most vulnerable be reached with this approach?	Have sufficient vendors willing to accept vouchers been identified? Cross-reference with C.2 (4,5,6,7).	Can enough fairs be organized at needed scale and in time, with staff trained? Can vouchers be printed in time?				
		<b>YES</b> ▼	<b>No</b> Review logistical feasibility of other 'access' approaches.	<b>YES</b> ▼	<b>No</b> Review whether cash or DSD approaches can work logistically.	<b>YES</b> ▼	<b>No</b> Review whether cash or DSD approaches can work logistically.	
<b>C2.3 Timeliness</b> <b>Can the program be completed before planting time?</b>	<div style="border: 1px solid black; padding: 2px;">                     1 ~~~~                      2 ~~~~                      3 ~~~~                      4 ~~~~                 </div>	Can the cash transfer (direct or digital) be fully completed prior to farmers' sowing?	Can the voucher program be fully completed prior to farmers' sowing?	Can the vouchers and fairs be fully completed prior to farmers' sowing?				
		<b>YES</b> ▼	<b>No</b> Review timeline feasibility of other access approaches..	<b>YES</b> ▼	<b>No</b> Review timeline feasibility of other access approaches.	<b>YES</b> ▼	<b>No</b> Review timeline feasibility of other access approaches.	

Key questions	Evidence	Cash		Vouchers		SVF		DSD
<b>C2.4 Crop choice</b> Can seed of the crops needed for the upcoming season be accessed?	1 ~~~~ 2 ~~~~ 3 ~~~~ 4 ~~~~	In the markets identified, can seed of the major crops for the upcoming season be accessed?		Are vendors putting on offer the major crops needed for upcoming season?		Are vendors putting on offer the major crops needed for upcoming season?		
		<b>YES</b> ▼	<b>No</b> Need to consider DSD, if crops needed can be procured from other sources.	<b>YES</b> ▼	<b>No</b> Review whether vendors can be incentivized to expand crop portfolio. If not, review cash or DSD as options to get 'right' crops.	<b>YES</b> ▼	<b>No</b> Review whether vendors can be incentivized to expand crop portfolio. If not, review cash or DSD as options to get 'right' crops.	
<b>C2.5 Variety choice</b> Can adapted and farmer-acceptable varieties be accessed?	1 ~~~~ 2 ~~~~ 3 ~~~~ 4 ~~~~	In the markets identified, can adapted and farmer-acceptable varieties be accessed?		Are vendors putting on offer adapted and accepted varieties?		Are vendors putting on offer adapted and accepted varieties?		
		<b>YES</b> ▼	<b>No</b> Need to consider DSD, if varieties can be procured from other sources.	<b>YES</b> ▼	<b>No</b> Review whether vendors can be incentivized to expand variety portfolio. If not, review cash or DSD as options.	<b>YES</b> ▼	<b>No</b> Review whether vendors can be incentivized to expand variety portfolio. If not, review cash or DSD as options.	
<b>C2.6 Seed Quality</b> Is the seed on offer of acceptable quality to farmers, gov't, and donors?	1 ~~~~ 2 ~~~~ 3 ~~~~ 4 ~~~~	In the markets identified, is the seed of the acceptable quality?		Are market vendors offering seed quality acceptable to farmers, gov't, and donors?		Are fair vendors offering seed quality acceptable to farmers, gov't, and donors?		
		<b>YES</b> ▼	<b>No</b> Probably need to consider DSD, if seed quality can be guaranteed for crops needed. Be sure to confirm quality of DSD seed.	<b>YES</b> ▼	<b>No</b> Review other approaches where seed quality is acceptable (linked to C.2.4 and C.2.5).	<b>YES</b> ▼	<b>No</b> Consider whether quality at fairs can be upgraded by on-site screening. If not, review other approaches where seed quality is acceptable (linked to C.2.4 and C.2.5).	
<b>C2.7 Farmer Choice</b> Can farmers be offered useful choices with this approach?	1 ~~~~ 2 ~~~~ 3 ~~~~ 4 ~~~~	N/A (Cash gives choice).		Are vendors putting on offer crop and variety choice sufficient for farmers?		Are vendors putting on offer crop and variety choice sufficient for farmers?		
		-	-	<b>YES</b> ▼	<b>No</b> Depends on flexibility with C.2.4, C.2.5, and C.2.6.	<b>YES</b> ▼	<b>No</b> Depends on flexibility with C.2.4, C.2.5, and C.2.6.	
<b>ACTION</b>		Proceed	No action	Proceed	No action	Proceed	No action	

**C3 Seed Quality** problems abound in smallholder farming systems. Problems with both aspects of seed quality – that is, seed health and variety suitability – often mean that farmers are sowing sub-optimal seed and getting poor results. Addressing constraints on seed quality requires concerted, multi-season action. While problems might manifest as acute, solutions need to work over the long term.

As a rule of thumb, seed quality problems are systemic. They fall into the category of chronic, not acute, stresses. The proposed responses, namely better storage and the introduction of modern stress-tolerant varieties, are band-aid solutions; they do not heal the deeper wounds.

### C3.1 Seed Quality (health): Better storage as response (option: hermetic storage bags)

Key questions to shape the response	Evidence	If YES	If NO
<b>C.3.1a</b> Efficacy of storage bags. Have the storage bags been previously confirmed under farmer management?		<b>Move to C.3.1b</b> ▼	Stop intervention. Consider whether other storage techniques are confirmed with farmers.
<b>C.3.1b</b> Do the aid recipients accept the storage technology?		<b>Move to C.3.1c</b> ▼	Stop intervention. Consider whether other storage techniques are acceptable to farmers.
<b>C.3.1c</b> Will the distribution systems reach recipient farmers?		<b>Move to C.3.1d</b> ▼	Stop intervention. Rework distribution system to reach even last mile areas.
<b>C.3.1d</b> Will the information systems reach recipient farmers?		<b>Move to C.3.1e</b> ▼	Stop intervention. Ensure full information component is in place (radio, SMS, text, posters – for illiterate and literate people).
<b>C.3.1e</b> Are feedback/evaluation systems in place?		▼	Stop specific intervention (including funding) until feedback/evaluation mechanisms are in place. These are required, not optional.
<b>ACTION</b>		<b>Proceed</b>	<b>No Action</b>

### C3.2 Variety Suitability: Diffusing varieties tolerant to stress at hand

Key questions to shape the response	Evidence	If YES	If NO
<b>C3.2a</b> Do new varieties combat stress?		<b>Move to C.3.2b</b> ▼	Stop intervention If variety is not useful to combat stress, do not promote it.
<b>C3.2b</b> Are new varieties productive under farmer management and acceptable to farmers and markets?		<b>Move to C.3.2c</b> ▼	Stop intervention. Do not diffuse varieties that do not meet farmers' needs.
<b>C.3.2c</b> Are new varieties being introduced in a manner that minimizes risk? ● in test sizes? ● giving farmers choice? ● with technical information?		<b>Move to C.3.2d</b> ▼	Stop intervention. Redesign intervention to minimize risk. Focus on information as well as the physical variety itself.
<b>C3.2d</b> Does information reach recipient farmers?		<b>Move to C.3.2e</b> ▼	Stop intervention. Ensure full information component is in place (radio, SMS, text, posters – for illiterate and literate people).
<b>C3.2e</b> Are feedback systems in place? Has monitoring has been built in to get immediate feedback and chart performance over several seasons?		<b>Proceed</b> ▼	Stop intervention (including funding) until feedback/evaluation mechanisms are in place. Feedback and evaluation systems are required, not optional.
<b>ACTION</b>		<b>Proceed</b>	<b>No Action</b>



Photo: Sean Sheridan/Mercy Corps

## 6 Greater effectiveness in seed emergency responses

Important advances have been made in the seed aid field in the last decade. There are now better assessment tools for seed security (versus food security only). The array of response options has been broadened but also refined, especially in the area of sharpening crop and variety choice towards specific goals and in aiming to give farmers greater choice. Also, market-based approaches are now more visible, particularly on the client-farmer side.

This Seed Emergency Response Tool has brought together up-to-date experience and advice on choosing and implementing seed security responses. It has reviewed some lessons around current 'better practice' and suggested paths for future improvements. Several themes bear re-emphasis in this concluding section.

### Tackle some of the bottlenecks

As practitioners move toward more effective responses, they nevertheless encounter the same constraints repeatedly. Some are more general, others specific to individual organizations. As a start, implementers should list and analyze their most compelling constraints on better practice and aim to solve or lessen their limitations one by one. An example of a more global constraint or bottleneck might be the seed quality requirements in place. These often restrict the type of response that can be implemented, the type of crop and variety that might be put on offer, and even the timing during which an intervention may unfold. So, as a practical step forward, navigating and debating seed quality demands might be a priority for humanitarians. Options should be discussed and multiple creative solutions proffered.

### Test (prudently) response interventions that herald possible gains

The scant use of market-led approaches is a big area in need of further exploration. Local markets, in particular, serve as seed security safety nets for poorer farmers and for the majority of farmers in times of stress. Supporting and improving local markets could bring very important gains. Possible entry points for improving and leveraging local markets might focus on fostering better seed health or on enhancing variety suitability for farmers.

### Use existing knowledge

Using existing guidelines, checklists, decision trees, and other tools should result in important seed aid improvements. This SERT (including the references section) is part of that body of practical knowledge and resources. Donors, national and local policy makers, and implementers need to disseminate knowledge on better practice, train personnel in its use, and put incentives in place to ensure that existing 'better advice' actively shapes practice.

### Recognize when seed aid may not be the best option

Optimistic as seed aid practitioners may be, bad practice persists. Recognizing the signals is key. If an organization repeats seed aid, in the same area and for the same population, three years in a row, it should conduct or demand a review. If practitioners chart a timeline on delivery and seed cannot arrive in farmers' hands during their normal sowing period, stop and think about appropriate non-seed assistance options.

Farmers must be key decision makers and players in any emergency intervention to protect seed security.



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To close, we re-emphasize that conscious choices are needed to make the field of emergency seed aid more effective. Current better practices need to be promoted and promising new options rigorously tested and evaluated. Seed security response can and should be a dynamic field. As farmers' circumstances are constantly changing, the field of emergency seed aid should be innovative, evolving to meet emerging challenges and possibilities. We need to learn from mistakes and not repeat them. Moving proactively, managers and field practitioners should promote comprehensive documentation and the frank sharing of lessons in relation to all phases of emergency seed security response: assessments, intervention implementation, and evaluation of on-the-ground programs.

It is hoped this SERT will strengthen the emergency seed aid field. Along with other knowledge resources like it, this SERT can make humanitarian aid more effective. If used wisely, such advice can shape better practice, translating into real advances in the lives of farm families under stress.



Photo: Ezra Millstein/Mercy Corps

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## Appendices

### Appendix I Seed quality and seed relief

#### What is seed quality?

The quality of seed is among the central parameters of seed security. It has two broad aspects: seed quality *per se*, sometimes shortened to seed health, and varietal suitability, sometimes called variety quality. Seed quality consists of physical, physiological, and sanitary attributes such as germination rate, plant vigor, and absence/presence of disease, stones, sand, broken seed or weeds. Varietal suitability consists of genetic attributes, such as plant type, duration of growth cycle, and seed color and shape.

The quality of seed delivered through seed assistance is an important concern – for recipient farmers, donors, governments, and seed aid practitioners alike. Everyone has heard horror stories of seed that failed to emerge or failed to flower and yield, leaving farm families even more food insecure. It is essential that the seed delivered via seed aid is of acceptable quality so that the seed hastens the recovery process.

#### Balancing issues of quality: seed health and varietal suitability

Issues of seed quality shape the types of seed assistance that can unfold. In emergency seed procurement, quality issues most often focus on whether the seed is healthy and physically pure. Some donors require formal certification as a prerequisite for seed procurement, while others ask that the quality procedures be explicitly described (see quality standards section below). Quality stereotypes equate seed coming from the formal sector or commercial sources as being of high performing varieties and with high germination and good seed health, and seed coming from the informal sector (home-produced and procured from the local market) as being low performing traditional varieties and with poor seed quality. Such labels can be deceptive. The ‘health’ quality of formal-sector seed may not be as advertised (possibility due to deterioration in storage or transport). Farmer seed and market seed has also sometimes proven to be ‘objectively’ of good quality, as assessed in select laboratory analyses (see CIAT, 1991).

The focus on the seed health parameter of ‘quality’ in emergency has diverted attention away from what is equally an important quality issue: the variety on offer. At the very least, the variety must be adapted to the stress conditions, and have generally acceptable crop characteristics (for farmers and markets). Puzzlingly, genetic (variety) quality, in practice, has been given second priority in emergency responses. While relatively few crops and varieties are multiplied by the formal research sector and commercial companies, those emerging are assumed ‘good enough’ for emergency distribution whether or not they:

- ◆ have been selected for use in the regions of stress
- ◆ can be grown under the farmers realistic management conditions
- ◆ prove acceptable to those preparing food or selling at local markets.

So, in the relief business, there are often trade-offs to accessing seed with a given varietal quality versus seed with a given health/physical quality.



Photo: Georgina Smith/PABRA



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We note that the quality of planting material of the vegetatively propagated crops such as cassava, sweet potato, banana, and potato is often much more difficult to control than that of seed-propagated crops.

### Quality standards (modified partly from FAO)

Formal seed quality standards set out the characteristics of good-quality seeds. (See FAO, 2010a, 2010b, for exact parameters by crop, as quantitative standards do vary between crops.) These standards use different assurance protocols that require clear rules and guidance in seed production and testing. In an emergency, two types of formal standards are common:

- **Certified seed** Seed produced with established quality standards and government enforcement of prescribed standards. The official certifying agency (usually governmental) is the unit with final responsibility for seed quality.
- **Quality-declared seed (QDS)** Seed produced by select farmers who themselves are responsible for seed quality. The government plays a monitoring role, e.g., using its extension staff for field inspection (FAO, 2006).

Some donors also accept less formal standards as long as the testing and quality-guarantee processes are clear and ensure that farmers receive productive seed (USAID, 2021).

### Practical application of seed quality standards in emergencies

In terms of practical advice, a group of experts gathered at the UN-FAO in Rome in 2003 (FAO, 2004) and offered some guidance, which still holds true several decades later.

- If the seed is obtained through formal channels (for example, for most vegetable seed and for hybrid maize), it should meet standards of certification (e.g., national seed certification standards or those under the OECD seed schemes) or of quality-declared seed (QDS).
- If the seed is obtained from farmers or local markets (for example, as bulk grain, which is often the case for staple crops such as sorghum and millet), it should be cleaned and tested to ensure that it meets certain minimum standards for the parameters listed.
- If seed is not directly supplied, but rather access to seed is facilitated through mechanisms such as seed fairs, then other approaches to quality assurance are needed, for example:
  - ◆ formal suppliers may be required to meet formal certification or QDS requirements
  - ◆ seed of all suppliers should be subject to visual examination by farmers and other experts
  - ◆ samples of seed should be tested for germination and physical purity by a qualified expert (some simple tests are available for these purposes).
- Significant seed suppliers that provide seed of poor quality should be barred from providing seed in the future, whatever the seed delivery mechanism.

In all cases, rigorous ex post evaluations of seed performance should be carried out, after planting and emergence and after harvest.

## Appendix II Minimum technical standards for Seed System Assessment (SSA) in emergencies

USAID/OFDA, SeedSystem and UN/FAO consultations



This appendix introduces the minimum standards that must be respected in a Seed System Assessment (SSA)<sup>5</sup> for the work to be considered technically sound, including the key data and essential processes.

These standards should enable the humanitarian community, governments, funders, and other stakeholders to have greater confidence in assessments performed by a range of actors. They can also guide those responsible for program quality in their planning, data collection, data analysis, and roll-out phase of seed security interventions.

The intent of these minimum standards is to identify the critical elements needed for a seed system assessment to:

- have sufficient technical rigor to produce quality data through use of accepted methodologies and seed system analysis
- have sufficient evidence (versus assumptions or bias) to represent a neutral and informed analysis of the situation on the ground
- be sufficiently context-sensitive (to sociopolitical and agroecological conditions, and to farmer and crop profiles) to guide a specific seed security-related response(s).

Seed system assessments may be conducted in suboptimal circumstances. There may be security concerns, language barriers, challenging working conditions (e.g., difficult roads), and short time frames for planning sufficiently for an upcoming season. For these reasons, the identified list of minimum standards contains just the essentials – it is a practical list, not an academically complete one.<sup>6</sup>

Below, we suggest the range of content addressed in SSA minimum standards. The full standards that can guide field teams in detail can be accessed at [seedssystem.org/article/minimum-technical-standards-for-seed-system-assessment-ssa-in-emergencies/](https://seedssystem.org/article/minimum-technical-standards-for-seed-system-assessment-ssa-in-emergencies/).

### Background/context work

#### 1 Brief description of disaster/stress

Basic elements to include:

- a Overview of salient broad features that could affect agricultural intervention.

<sup>5</sup> Other terms in current usage are Seed System Security Assessment (SSSA) and Seed Security Assessment (SSA).

<sup>6</sup> When time and resources allow for a more comprehensive SSA, users may wish to consult more detailed guides to methods. <https://seedssystem.org/assessments-and-e-learning-course/> <http://www.fao.org/resilience/resources/resources-detail/en/c/282218/>



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- b** Timing in the agricultural season when the disaster hit, and possible effects on crop production.
- c** Initial appraisal showing agricultural recovery is contextually possible and appropriate (i.e., farmers are ready to plant and engage in agriculture; there is sufficient access to land, stability and security to suggest that what is planted can be harvested; and agricultural support will do no harm).
- d** Indication that this is an acute stress, chronic stress, or both.

## **2 Rationale for seed security-linked assessment**

The rationale for conducting an assessment needs to be explained in multiple ways.

## **3 Place**

The general and specific locations help interpret the findings.

## **4 Timing of assessment**

Indication that the timing of the assessment will allow for a response tailored to a particular season(s). The recommendations must account for the specific logistics of planning and implementing such a response (e.g., to deliver seed on time).

## **5 Background work**

No matter how tight the time frame, preparatory work and complementary studies are needed to provide background information on critical features:

- a** Agricultural seasons, crop calendar, major crops for each main season.
- b** Seeding rates for each crop, i.e., actual farmer rates, not formal sector recommended rates.
- c** How the formal seed sector operates in the area (and for which key crops).
- d** How the informal seed sector operates in the area (and for which key crops).
- e** How the intermediary seed sector, e.g. community-based seed producers, operates in the area.
- f** Crops/varieties adapted to the area and to stresses.
- g** Farmer preferences for crops and varieties intended for sale and/or home consumption.
- h** How the use of crops and varieties changes over time (5 years, 10 years?) and what drives those changes (markets, climate stress?).
- i** How social issues, such as those related to gender, vulnerable groups, and ethnicity, affect smallholders and their seed security in the stressed area.

## **Broad content: what the field assessment should examine**

### **6 Broad domains to include**

These are as important as the specific field questions to be addressed (points 7-11). The broad domains listed here are essential:

- a** All seed systems that farmers use: formal, informal, and intermediary;
- b** Seed or planting material, plus other essential inputs that are routinely used (e.g., fertilizer, pesticides), as well as postharvest and storage practices that affect seed;



- c The range of major annual crops essential for food security, nutrition, resilience to climate stress, and income;
- d Farmer-expressed need/demand side and the supply side;
- e Differences among farmers, by gender of household head, by area of cultivated land, and by vulnerability.

## Methods / processes – how the assessment should be done

### 7 Field evidence needed: Demand side

Field evidence has to be collected from the demand side, namely the farmer clients/beneficiaries. This can be done from individual surveys, focus groups, or both, but has to be done independently of the promise of any aid (so as to avoid bias). Key issues/questions:

- a Where have farmers obtained their seed, by crop, prior to disaster, and where do they plan to obtain their seed? Is this pattern 'normal', adaptive, or otherwise?
- b What amounts have been sown or will be sown, relative to a 'norm'? Are farmers planting more, less or the same land area they 'usually' do?
- c Have there been changes in crop choice or sowing patterns? Are the constraints related to seed or non-seed factors (e.g., labor, security)?
- d How much money is/has to be used to access seed (current plus next season)?
- e What are the key differences among groups (by gender, HH, and land size or residency status or type of household head)?

### 8 Field evidence needed: supply side (formal , informal, intermediary seed sectors)

The supply side analysis has to include all types of markets (including the informal which are often overlooked) and has to carefully distinguish supply by crop, especially those for the upcoming season. Key questions/issues:

- a What are the different types of markets supplying seed and planting material to farmers for different key crops in the current stress period: formal, informal, intermediary (e.g., community-based seed producers) and others.
- b How do markets function during the stress period? For example, can market days even be held?
- c What is the current and potential supply with regard to:
  - i crop/variety availability
  - ii price
  - iii quality
  - iv possible supply gaps for particular crops/varieties.

### 9 Critical indicators if problems/constraints are identified (with explanations)

There is a need for transparent and specific indicators of any problems or constraints identified. (Use of a seed security framework is one possible tool for investigating these.)

- a Indicators on farmer/demand side (whether availability, access/price, quality, or other).
- b Indicators on the supply side (whether availability, access/price, quality, or other).

- c Problems or indicators of dysfunction affecting specific crops or seed channels.
- d Problems or indicators of special stresses among specific client/beneficiary groups.

## 10 Critical indicators if there are opportunities

There is a need also to examine opportunities, including existing positive trends or possible sources of innovation.

- a Indicators of new markets, new services.
- b Indicators of new crops, new varieties (and that they are adapted and accepted by farmers, consumers or traders).
- c Other indicators of positive farmer strategies (e.g., changing crop profiles or management practices).

## 11 Analysis

Prior to data collection, there should be a plan for analysis. See 7, 8, 9 and 10 for content.

## 12 Response choice

Beyond gathering evidence, the goal of the assessment is to identify a response strategy and programming plan. While the need for precise evidence has been described above, there is an equal need to link that evidence to choice of response. Both short- and medium-term responses should be routinely considered as the disaster or stress context usually encompasses both acute and chronic elements. Also, even in an emergency there may be important recovery and development opportunities (refer to indicators in 9 and 10). Short-term generally covers the first few growing seasons (typically 1 to 3) after the shock and gives attention to both major and secondary seasons. Medium-term covers any actions over 3 to 5 seasons. Follow-up programming is usually needed to help address chronic stress and to strengthen seed systems and seize possible opportunities.

A final point: Assessments should be professionally written up and disseminated to key decision makers.



Photo: Sean Sheridan/Mercy Corps

## Appendix III Evaluation of seed security interventions

Seed security interventions can only be strengthened if all involved better understand what has unfolded on the ground, that is, if the humanitarian field strengthens the evidence base. A commitment to evaluation is important from multiple viewpoints. Practitioners need to regard evaluation as an essential learning opportunity. Donors need to support practitioners in contributing to a learning evidence base, rather than merely holding practitioners accountable for mistakes made.

This appendix suggests topics of evaluation specifically important in seed security interventions. Several overall points are key:

- 1 Different types of evaluations are needed at different points in time.
- 2 All suggested evaluation types (Table 8 below) are important and are not interchangeable.
- 3 Evaluation themes may change through time. The effects of an intervention may not necessarily be discrete to a time period but may rather build one upon the other. Hence, an intervention might have 'cascading effects' or 'cumulative effects'.
- 4 The recipients' (farmers') views as well as those of practitioners have to figure among the essential elements.

### Types of evaluation

There are at least five different types of evaluations important for seed security interventions.

#### Real time evaluations

One can use interviews – for example, just after seed distribution or as people leave seed fairs – to obtain feedback from aid recipients. This feedback can be used immediately to inform the next planned aid event. Real time evaluations monitor information to ensure that the process is on track and that problems are identified and corrected as quickly as possible.

#### Output evaluations

Interviews are conducted right after the intervention (for example, within one month) to provide feedback from direct implementers, partners, and farmer recipients on the logistics of the intervention, i.e., its timing, targeting, distribution mode, etc. This is the classic type of post-event evaluation that often satisfies donor requirements and closes a project.

#### Outcome evaluations

At the end of the cropping season, interviews are conducted to evaluate the effectiveness or outcomes of the intervention in terms of effects on crop production and the next season's seed security. An outcome evaluation shifts the focus from what was done (outputs) to what elements of the assistance contributed to farmers' and farming community recovery.

#### Impact evaluations

Longer term follow-up, conducted after three to five seasons, evaluates the broader impacts of the interventions on food security, resilience, nutrition, and income generation (depending on the original intervention goal).



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## Meta-analyses and evaluations

This type of evaluation compares several interventions at once. The interventions may be of the same type (for instance, several direct seed distributions) or they may represent different approaches (for instance, direct seed distribution, seed vouchers and fairs, and market-led support). Meta-analyses may even assess the totality of seed system interventions in a given geographical area. Such evaluations can also be used to compare performance across countries, with different seed systems, experiencing different disasters and different levels of seed insecurity.

Meta-analyses generally focus on the effectiveness of the approach itself. They are of special interest to practitioners committed to learning how to improve seed-aid planning and implementation. They compare the strengths and weaknesses of different kinds of response.

Table 8 sketches themes for the different types of evaluations. The guide questions are meant to be suggestive rather than comprehensive.



**Table 8 Themes to address in evaluating seed security programs**

Type of evaluation	Assessment from both implementer and recipient perspectives
<b>Real-time (during intervention)</b>	<p>Guide questions on:</p> <ul style="list-style-type: none"> <li>● Products on offer (crop and variety choice, seed quality, seed amounts)?</li> <li>● The immediate intervention process</li> <li>● Length of intervention, including waiting time?</li> <li>● Number and order of farmers served?</li> <li>● Adequacy of support personnel?</li> </ul>
<b>Output (after about one month)</b>	<p>Guide questions on: the efficiency, organization, and logistics of intervention:</p> <ul style="list-style-type: none"> <li>● Timing (especially in relation to subsequent planting)?</li> <li>● Targeting (process and perceived 'fairness')?</li> <li>● Choice of locales?</li> <li>● Choice of crops and varieties?</li> <li>● Adequacy of seed quality on offer (and validity of process guiding quality verification)?</li> <li>● Adequacy of preparatory information or sessions?</li> <li>● Scale (numbers served, overall amounts of seed or products delivered or made accessible)?</li> </ul> <p>What worked? What was missing? What modifications should be made in future?</p>
<b>Outcome (after first season)</b>	<p>Guide questions on first effects of intervention:</p> <p><b>Recipient Focus:</b></p> <ul style="list-style-type: none"> <li>● Yield performance and farmer satisfaction with crops and varieties obtained as aid (qualitative and quantitative variety attributes)?</li> <li>● Importance of seed aid in relation to farmers' other seed sources?</li> <li>● Proportion of the aid given that was sown and why?</li> <li>● Proportion of the total seed sown that came from aid (versus home-saved seed, local markets, exchange) and why?</li> </ul> <p><b>Farming System and Implementer Focus:</b></p> <ul style="list-style-type: none"> <li>● Was the impact of the disaster on farming systems sufficiently understood to guide planning (looking with hindsight)?</li> <li>● Was the general choice of intervention valid (and linked to a seed security need)?</li> <li>● Was the intervention needed? Evidence?</li> <li>● Did the intervention strengthen or protect seed security? Evidence?</li> <li>● Which broad groups were reached by the intervention and which not?</li> <li>● Were there any unanticipated positive effects? Or negative effects?</li> </ul> <p>What worked? What was missing? What modifications should be made in future?</p>
<b>Impact evaluations (after several seasons)</b>	<p>Guide questions: Impact – positive and negative – of intervention on:</p> <ul style="list-style-type: none"> <li>● Stability of production and food security?</li> <li>● Biodiversity of crops and varieties?</li> <li>● Household income and local economy?</li> <li>● Household nutrition?</li> <li>● Seed channel functioning, including local development of commercial enterprises?</li> <li>● System resilience to possible next set of shocks?</li> </ul>
<b>Meta-analyses (after cluster of interventions completed)</b>	<p>Content here would vary according to what is being compared.</p> <p>Some general themes:</p> <ul style="list-style-type: none"> <li>● Comparative advantages among different interventions (e.g., cash and voucher delivery</li> <li>● direct seed distribution</li> <li>● seed vouchers and fairs, seed protection rations)</li> </ul> <p>For which contexts?</p> <ul style="list-style-type: none"> <li>● Immediate effects and on whom? <ul style="list-style-type: none"> <li>◆ range of benefits and costs: agronomic, environmental, economic, social</li> </ul> </li> <li>● Longer-term effects and on whom? <ul style="list-style-type: none"> <li>◆ Range of benefits and costs: agronomic, environmental, economic, social</li> </ul> </li> </ul>

Source: modified from Sperling et al, 2006

## Glossary

**Agrodealer** Specialized farm input stores selling directly to farmer customers. Sometimes linked to a bigger private sector input company.

**Certified seed** Seed of a known variety produced under strict, formally regulated seed standards to maintain varietal purity and a high level of seed health. Seed lots must also be free of inert matter and weed seeds. All certified seed must pass field inspection, be conditioned by an approved seed conditioning plant, be sampled, and pass laboratory tests before being sold as certified seed.

**Cash and voucher assistance (CVA)** Cash or vouchers are provided either directly or via remote transfer, so as to give the recipient farmers purchasing power. With cash, farmers can buy whatever they want, such as seed of their preferred crop varieties, from venues of their choice (assuming voucher payment is accepted).

**Direct seed distribution (DSD)** A form of relief aid in which seed is procured, often from outside the region, for delivery to farmers because seed is assumed to be unavailable locally. It is the most widely used approach to seed relief.

**Formal seed system** Production, supply, and certification of seed of modern varieties through an organized chain including specialized plant breeders, regulated seed producers, and specialized commercial outlets or government extension agencies.

**Hybrid** The first-generation seed of a cross between two different parents. The next generation often displays special vigor. The seed cannot be replanted with the same expected performance. To maintain vigor, hybrid seed has to be re-bought every planting. Hybrids are often associated with maize or vegetable seed.

**Informal seed system** Also known as 'local', 'traditional' or 'farmer' seed system. Seed is obtained from farmers' own harvests, social networks or local markets. This system can diffuse local or modern varieties (which are recycled). It is governed by local norms of practice rather than official or government standards. Seed is not backed by formal certification.

**Intermediary seed system** Combination of different aspects of the formal and local seed supply systems aimed at improving overall system performance. An example is a community-based seed group that gets outside technical support. Intermediary seed systems tend to be locally based.

**Local seed system** See informal seed system.

**Modern variety** A variety developed by formal plant breeders that is distinct, uniform, and stable. The term is sometimes used interchangeably with 'high-yielding variety' and 'improved variety'. The latter labels are somewhat misleading as a modern variety may not always perform better, especially when used under smallholder conditions.

**Quality-declared seed** Seed produced within a specific regimen to provide quality control during seed production, with the level of standard clearly defined



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(FAO, 2006). The procedures are less demanding than those linked to full seed certification but deemed to be legally adequate in many countries.

**Seed** Anything used as planting material. It may be in the form of a grain or a part of a plant (stem, vine, sucker, tuber).

**Seed health** The presence or absence of disease-causing organisms in a seed sample or lot, such as fungi, bacteria, and viruses, and animal pests (for example, nematodes and insects).

**Seed quality** The quality of seed has two broad aspects: seed quality per se (sometimes shortened to seed health) and varietal suitability (sometimes called variety quality). Seed quality consists of physical, physiological, and sanitary attributes such as the germination rate, plant vigor, and absence/presence of disease, stones, sand, broken seed or weeds. Varietal quality consists of genetic attributes, such as plant type, duration of growth cycle, seed color, and shape.

**Seed Security Assessment/Seed System Security Assessment (SSA/SSSA)** An assessment that examines all the seed channels farmers might use and determines if they are functioning sufficiently to serve farmers' needs. It focuses on both the supply and demand side and determines whether there are constraints in seed availability, access or quality.

**Seed security framework (SSF)** A conceptual framework that distinguishes among the key aspects of seed security: seed availability, seed access, seed health, and variety suitability.

**Seed vouchers and fairs (SVF)** A form of relief aid whereby aid agencies give farmers vouchers that can be redeemed for seed at organized events (fairs). Fairs serve as ad hoc marketplaces where farmers can access different crops/varieties from sellers, who may be other farmers, traders, or formal sector representatives (from government seed agencies or private companies).

**Self (or open-pollinated) variety** Reproduction type in crops that will 'breed true'. When sown, the seeds will produce plants roughly identical to their parents. Crops in this category include common bean, groundnuts, wheat, and sorghum.

**Traditional seed system** See informal seed system.

**Variety quality** Plant genetic attributes such as plant type, duration of growth cycle, and seed color and shape. (Also known as genetic quality.)

**Variety turnover** The process by which old varieties are replaced by new ones in farmers' fields. The turnover (and its rate) is deemed by some as critical to help farmers adapt to change, e.g., climate stress, as well as to spur higher production.

**Vegetatively propagated crops** Crops reproduced by growing a fragment of the parent plant or which grow from a specialized reproductive structure such as a tuber, stem or vine (cuttings). Cassava, sweet potato, and bananas fall into this category.

## Key resources

### Seed security assessment guides

FAO. 2016. **Seed security assessment: a practitioner's guide**. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO). (Included above in References Cited.)

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Sperling, L. 2008. **When disaster strikes: a guide to assessing seed system security**. Cali, Colombia: International Center for Tropical Agriculture (CIAT). (Included above in References Cited.)

[seedssystem.org/wp-content/uploads/2014/03/sss\\_manual\\_ciat.pdf](http://seedssystem.org/wp-content/uploads/2014/03/sss_manual_ciat.pdf)

**Seed system security assessments + response**. 2019. e-learning course  
[seedssystem.org/assessments-and-e-learning-course/sss-e-course/](http://seedssystem.org/assessments-and-e-learning-course/sss-e-course/)

### Response approaches

CRS. 2017. **Agricultural fair and voucher manual**. Baltimore, USA: Catholic Relief Services. (Included above in References Cited.)

[www.crs.org/sites/default/files/tools-research/agricultural-fair-and-voucher-manual-2018.pdf](http://www.crs.org/sites/default/files/tools-research/agricultural-fair-and-voucher-manual-2018.pdf)

FAO. 2018. **Fao and cash+ How to maximize the impacts of cash transfers**.  
[www.fao.org/3/I8739EN/I8739en.pdf](http://www.fao.org/3/I8739EN/I8739en.pdf)

Keane, J.; Brick, D.; and Sperling, L. 2019. **Study on cash transfers for seed security in humanitarian settings**. A Feed the Future Global Supporting Seed Systems for Development activity (S34D) report. (Included above in References Cited.)

[seedssystem.org/wp-content/uploads/2021/01/Cash-transfers-for-seed-security\\_final3.pdf](http://seedssystem.org/wp-content/uploads/2021/01/Cash-transfers-for-seed-security_final3.pdf)

Mercy Corps (no date). **Voucher and fair implementation guide**. (Included above in References Cited.)

[www.mercycorps.org/sites/default/files/2020-01/VoucherFairGuide.pdf](http://www.mercycorps.org/sites/default/files/2020-01/VoucherFairGuide.pdf)

ODI Seeds and Biodiversity Programme. 1996. **Seed provision during and after emergencies**. (Included above in References Cited.)  
[odihpn.org/resources/seed-provision-during-and-after-emergencies/](http://odihpn.org/resources/seed-provision-during-and-after-emergencies/)

Walsh, S. and Sperling, L. 2019. **Review of practice and possibilities for market-led interventions in emergency seed security response**. A Feed the Future Global Supporting Seed Systems for Development activity (S34D) report. (Included above in References Cited.)

[seedssystem.org/wp-content/uploads/2020/06/Market-led-Interventions-in-Emergency-Seed-Security-Response-report.pdf](http://seedssystem.org/wp-content/uploads/2020/06/Market-led-Interventions-in-Emergency-Seed-Security-Response-report.pdf)



contents



## Background information: seed systems, gender, resilience

Almekinders, C. and Louwaars, N. 1999. **Farmers' seed production**. London, UK: Intermediate Technology Publications, Ltd. (Included above in References Cited.)

CGIAR Research Program on Roots, Tubers and Bananas (RTB). Undated.

**Toolbox for working with root, tuber and banana seed systems**. Website on seed systems of banana, cassava, potato, sweet potato, and yam, hosted by the International Potato Center (CIP), Lima, Peru. (Included above in References Cited.)

[tools4seedsystems.org/](http://tools4seedsystems.org/)

Kramer, Berber, and Galiè, Alessandra. 2020. **Gender dynamics in seed systems development**. PIM Synthesis Brief November 2020. Washington, DC, USA: International Food Policy Research Institute (IFPRI).

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Mercy Corps. 2019. Mercy Corps resilience approach to relief, recover and development. (Included above in References Cited.)

[www.mercycorps.org/sites/default/files/2019-11/ResilienceApproach.pdf](http://www.mercycorps.org/sites/default/files/2019-11/ResilienceApproach.pdf)

Website focusing on smallholder farmer seed systems. It provides practical guidance to help professionals design seed-related assistance in developmental, chronic stress, and emergency contexts.

[SeedSystem.org](http://SeedSystem.org)

World Bank; Food and Agriculture Organization; International Fund for Agricultural Development. 2009. **Gender in agriculture sourcebook**.

**Agriculture and rural development**. Washington, DC: World Bank.

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## Quality standards

FAO. 2006. **Quality declared seed system**. FAO Plant Production and Protection Paper 185, Rome, Italy: Food and Agriculture Organization.

[www.fao.org/3/a0503e/a0503e00.htm](http://www.fao.org/3/a0503e/a0503e00.htm)

FAO. 2010a. **Seeds in Emergencies: a technical handbook**. FAO Plant Production and Protection Paper 202, Rome, Italy: Food and Agriculture Organization. (Included above in References Cited.)

[www.fao.org/3/i1816e/i1816e00.pdf](http://www.fao.org/3/i1816e/i1816e00.pdf)

FAO. 2010b. **Quality declared plant material: protocols and standards for vegetatively propagated crops**. FAO Plant Production and Protection Paper 195, Rome, Italy: Food and Agriculture Organization. (Included above in References Cited.)

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