

Seed Aid for Seed Security

ADVICE FOR PRACTITIONERS

Understanding Seed Systems Used by Small Farmers in Africa: *Focus on Markets*

A great deal has been written on formal and informal¹ seed systems in Africa. However, the importance of the local seed/grain markets² has gone largely unrecognized and unappreciated as a distinct and expanding presence. This brief will introduce the formal and informal seed systems and highlight the growing importance of seed/grain markets for seed system stability and growth. It will also suggest concrete opportunities for greater integration of the formal and informal seed systems – centering on the strengthening of local markets during normal times as well as during disaster periods.

Formal and Informal Seed Systems

Farmers, particularly smallholder farmers, use many systems to access seeds.

The formal seed system can be characterized by a clear chain of activities. It usually starts with plant breeding and promotes materials for formal variety release and maintenance. Regulations exist in this system to maintain variety identity and purity as well as to guarantee physical, physiological and sanitary quality. Seed marketing takes place through officially recognized seed outlets, and by way of national agricultural research systems (Louwaars 1994) and even through relief seed programs. The central premise of the formal system is that there is a clear distinction between 'seed' and 'grain'. Formal systems are especially important when seed is used to grow crops for commercial purposes (for example export or further food processing) and the uniformity and high quality of the product has to be guaranteed.

The informal seed system is basically what the formal system is not. Seed-related activities tend to be integrated and locally organized, and the informal system embraces most of the other ways in which farmers themselves produce, disseminate and procure seed: directly from their own harvest, through barter among friends, neighbors and relatives, and through local grain markets or traders. The same general steps take place in the informal system as in the formal but as integral parts of farmers' grain production rather than as discrete activities. Local technical knowledge and standards guide informal seed system performance, including the prevailing market forces. Perhaps because of its local specificity to needs and preferences the informal system provides most of the seed farmers use, worldwide between 80% and 90% of stocks. The important exception concerns hybrid maize (see Box 1).

Figure 1 overleaf shows schematically the formal and informal dimensions of seed systems and how flows of varieties and information between the two are routine.

¹ The "informal system is sometimes also referred to as 'local', 'farmer', or 'traditional' seed systems.

² We use the word 'local' seed/grain market to distinguish it from centralized more formal commercial enterprise. Seed arriving in the local markets is sometimes sourced from areas quite distant.

There are significant opportunities to improve the integration of formal seed systems with seed/grain markets. These cluster around linking such markets to sources of new varieties, supporting training in seed production and providing business development services to emerging smaller-scale seed enterprises.

BOX 1

Hybrid Maize: The Special African Case

It is hybrid maize that provides the exception to the rule in terms of local system seed use. Maize hybrids have been the main growth engine for formal sector seed and for profitable commercial enterprise in Africa. Quite simply, maize lends itself to commercial seed production.

- Maize outperforms other cereals (pearl millet, sorghum, upland rice) in high-potential, rain-fed agro-ecoregions. The area planted to maize is large and the demand for seed substantial.
- Commercial (modern) maize varieties can significantly outperform local (traditional) varieties across the better environments.
- Genetic quality of commercial maize varieties (especially hybrids) erodes under farmer seed management (when seed production is integrated with crop production).
- Hybrid maize seed production is technically complex, exceeding the management capacity of smallholder farmers.

Throughout Africa, governments and donors have supported the maize seed sector through breeding, extension, production subsidies and support to commercial seed enterprises. Large seed enterprises exist only where maize is an important commercial crop.

In East, Central and Southern Africa, informal and formal seed systems coexist and opinions diverge on the strengths and weaknesses of each. Proponents of informal seed systems often view the formal sector as a threat to crop system resilience and agrobiodiversity. Proponents of the formal seed

system believe that commercial seed production is a prerequisite for sustained increases in crop productivity through the use of high quality seed of new³ varieties. Increasingly, however, there is a realization that farmers are sourcing less and less seed from their classic 'informal' source – their own stocks – and that this farmer seed is not being replaced by commercial seed. Rather, farmers are sourcing seed from local seed/grain markets.

In reference to markets, it is important to distinguish between different types of seed/grain commerce. Local markets bring in grain, which is subsequently sorted and used by farmers for seed (hence the term 'seed/grain markets'). This is different from commercial, formal sector seed, which is specially produced as seed, on specialized fields, within the framework of a seed business enterprise.

Growing Importance of Seed/Grain Markets: an Evolution in Perspective

For a long time it was believed that farmers would buy seed on the local market only if they had failed to harvest own seed, or lost their stocks, or were unable to obtain seed from family, friends and neighbors. In Eritrea, for example, seed sourced in the market was commonly referred to as 'beggars' seed.

However, over the past five years, practical seed system analysis has sharpened our understanding of the role of the local seed/grain market. Thinking has evolved along these lines:

- Initial belief that sourcing seed in local markets was a symptom of the failure of the farmers' own ability to produce seed from harvest.

3 'New' is used to denote a variety developed by breeders in the formal seed system. It is used instead of 'modern' and 'improved.'

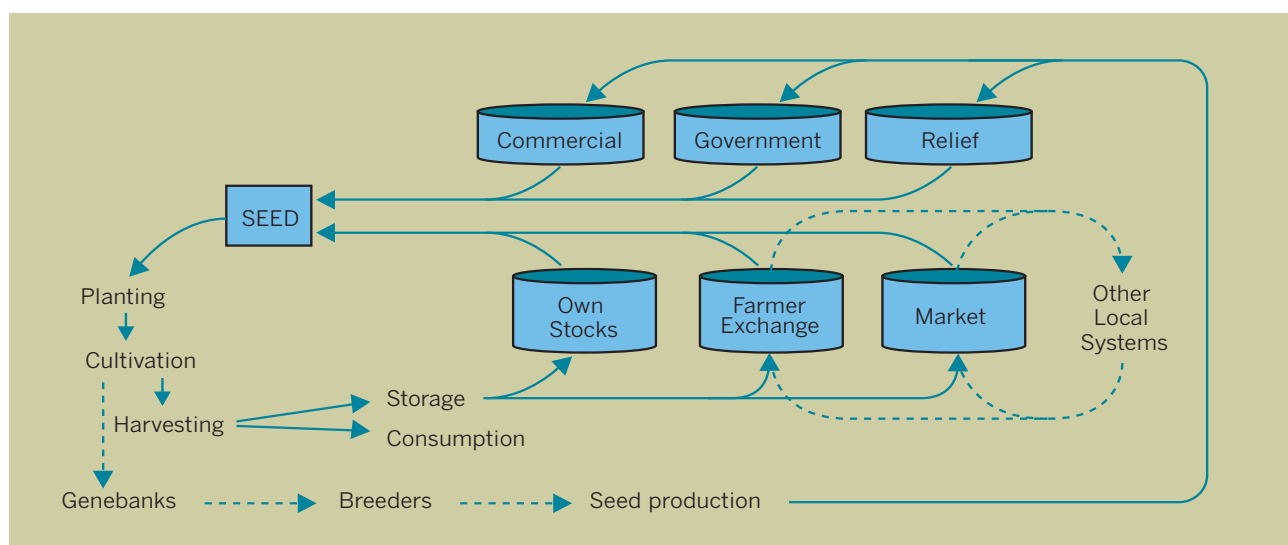


FIGURE 1: Channels through which farmers source seed are depicted by the cylinders. Own seed stocks, exchange with other farmers and purchase through local grain markets constitute informal channels. Commercial seed stockists, government or research outlets and relief supplies constitute formal channels. Adapted from Almekinders and Louwaars (1999), appearing in Sperling, Cooper and Remington, forthcoming).

- Acceptance that market seed is an important complement to farmers' own production and also to commercial, formal sector seed.
- Realization that the market seed channels are relatively efficient and that farmers rely on local market seed for sound reasons of convenience, availability of varieties, price and adequate quality.

Seed/Grain Markets: Reassessing Opportunities

Field analysis of seed systems has helped to question stereotypes and to identify opportunities rather than focus on constraints. Across Africa, market-related findings are demonstrating that:

- Market-sourced seed (especially for self-pollinated crops) serves as the core for seed security, especially among the more vulnerable farm families.
- Local grain markets, from which farmers obtain seed, prove durable in stress periods (during drought, flood and even instances of civil strife).
- The genetic quality of seed sourced in markets is most often acceptable to farmers, as it is generally grown in nearby agro-ecological contexts that match their own needs.
- The physiological and phytosanitary quality of seed purchased in local markets can be partially regulated (by sorting and acquisition from known contacts) and is often objectively good.
- Local seed/grain markets are often important channels for moving new varieties. In fact, for some crops, local markets move new varieties more effectively than formal diffusion channels.
- Markets prove to be a useful source for re-accessing seed of desired types and quantities that had been lost or temporarily abandoned in times of stress.

(See Sperling et al. 2004)

When analyzed within the context of the intensification of farming systems, the shift away from own-saved seed and toward local seed/grain markets is not surprising – particularly if markets can deliver a desirable range of crops and varieties, on time, and at acceptable quality and price. Today, seed/grain markets are the major source of seed for many farmers in many different cropping systems in Africa (for example, beans in Burundi, groundnut in Senegal and Gambia and most crops in semi-arid eastern Kenya).

Towards Integration of Local Seed/Grain Markets in Seed Sector Strategy

The Status Quo

Formal seed systems are presently poorly integrated with the local seed/grain channels. Formal systems are closely managed, from the development of varieties to multiplication and certification to

marketing by commercial outlets to farmers. One might read the formal strategy as consciously avoiding integration with local seed/grain markets.

The motive in doing so is to maximize commercial seed sales and company profitability through sustained volume sales. It is not to reduce farmers' costs or to maximize farmer return on seed investments. Hybrids are a good case in point. The advantage for the seller, the commercial enterprise, is that farmers have to buy seeds every year or every other year.

Recurrent purchases by farmers are obviously important for the sustainability of the commercial seed system. When small quantities of seed from the formal sector enter the informal seed system and are then multiplied and recycled within

social networks or acquired *via* grain markets, the revenues of the formal seed system remain low.

Perhaps because the strengths of local seed/grain market channels are largely unrecognized (or actively denigrated) such channels receive no support from either governments, who bolster the formal seed system, or from NGOs, who tend to support farmer production for home or local community use. Consequently, and in spite of its significance, the local seed/grain market has almost no formal access to new varieties, to basic (foundation) seed as an input, or to seed quality control services. In spite of this lack of support, there are dramatic examples of how quickly new varieties move through the local market system (for example beans in western Kenya and green grams in eastern Kenya), fueled by farmers' word of mouth that the new varieties on offer locally really do perform.

Traders and farmers' groups need continuing support to enable them to play a greater role in delivering higher quality yet affordable seed *via* local channels.

Moving Forward Towards Integration in Normal and Emergency Periods

If farmer production is to be maintained and strengthened seed sector analysts and practitioners need to give considerable thought as to how to support the local seed/grain markets. There are significant opportunities for better integrating the formal seed systems (and expertise) with the seed/grain market channels. These broadly cluster around facilitating access of seed/grain markets to new varieties, providing training in seed production (with an emphasis on higher, but affordable, quality), and providing business development services to these emerging, smaller-scale enterprises.

During Normal Times

During normal times, initiatives could usefully focus on improving both the variety and quality of seed sold in local markets, especially as this is proving to be a core source of seed for more vulnerable farm families. These include:

- Greater support needs to be given to increasing the seed quality of crops and varieties in greatest demand at the markets. These may be local varieties or they may be new ones, but those supplying large quantities of seed/grain to the market need to be trained to produce better seed (which does not need to be certified). Up to now, such training has been localized in small community-based groups, often by development projects. General knowledge on targeted ways to raise seed quality has to be mainstreamed in farming communities.
- Farmers and farmer groups need a good deal more training in agro-enterprise development. It is not enough to produce good seed. Such seed needs to bring profits on a continual

Market-sourced seed, particularly for self-pollinated crops, serves as the core for seed security, especially among more vulnerable farm families.

basis. The commercial sector has shied away from subsistence crops and open-pollinated varieties as the profits are not sufficient. Hence, communities have to diversify production among crops and varieties and, crucially, need to have ongoing supplies of new and appreciated materials to stimulate demand.

- In reference to the point above, direct links needs to be forged between variety innovators and those who can multiply and distribute seed at a decent price. Right now, new varieties filter through to communities unacceptably slowly. Research systems have to deliver new materials not only to seed parastatals and commercial communities but directly to important community-based nodes right across the country.
- Traders and farmer groups need continued access to quality control support – which is enabling and not threatening. A trader who becomes known for truly good seed should eventually be able to garner worthwhile price margins.

Such integration would direct benefits to farmers-consumers, traders and potentially to national economies as production gains translate into increased revenues. The commercial seed sector

could potentially benefit too, but only if the exposure of farmers to modestly better quality seed creates demand for the highly specialized products proffered by commercial enterprise.

During Emergency

The link between strengthened seed/grain markets in normal times and in disaster is direct. Higher quality seed and improved access is better at all times. Concerted, ongoing market strengthening should herald changes in the way such markets are regarded during periods of stress and emergency. For too long, seed for disaster relief has been sourced from the commercial seed sector, and its quality is often dubious. ('Commercial seed aid' is often but grain from market, conditioned, packaged and re-labeled; see the eastern Kenya and Zimbabwe cases in Brief No. 2).

Local seed/grain markets can increasingly be made use of in disaster response via distribution of vouchers, cash, or a combination of vouchers and seed fairs. In the past, such systems have delivered sufficient seed and seed of acceptable crops, varieties and quality. Local markets are also important features in regional economies. They need to be supported, not undermined, particularly in stress periods.

In sum, we need to look at local seed/grain markets as opportunities rather than constraints. With more targeted alliances, such markets can be crucial for moving new varieties from the formal sector more rapidly and more widely. With strategic support the products that local seed/grain markets offer can change from being 'farmer-acceptable and known' to 'much better than what the farmers have in their hands'. Finally, because the local seed/grain markets are so crucial to farmers' welfare, improvements in normal times immediately translate into improvements during periods of stress.

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ADVICE FOR PRACTITIONERS

Assessing Seed System Security

This brief maps the steps needed to assess seed security system and is intended for non-specialist emergency response practitioners and donors. It presents a number of insights that have evolved through recent research. The brief seeks to:

- Expose stakeholders to agriculture disaster assessment methods, with a focus on seed systems.
- Facilitate changes in knowledge, attitude and practice with regard to seed system security.
- Assist in identifying strategies for rapid and effective agricultural recovery.

Seed systems are complex and so are the impacts of interventions. Every organization approaches a situation with a unique set of values, experience and commitment. While the assessment approach presented here aims to promote a rigorous seed system security assessment (SSSA), we realize that actual practice is often rushed and based on less-than-perfect information and judgments. This tool may help practitioners to avoid some common shortfalls and promote reflection on how seed systems function.

This brief identifies the key seed security issues. Although the intention is to provide guidance to help practitioners move forward, certain institutions may, after reading this brief, decide not to do seed aid at all, but rather to leave such assistance to others with greater capacity. In general, it is probably preferable to offer seed aid only in concert with seed system security assessments.

Note that this brief is an excerpt from a larger manual (see below for full details); our aim here is simply to introduce the concept of SSSA and give an overview of process.

The State of Seed Security Assessments

Farm families are seed secure when they have access to seed and planting material of adequate quantity, acceptable quality and in time for planting. Seed security is best framed within the broader context of food and livelihood security. Helping farmers to obtain the planting materials they need will enable them to produce for their own consumption as well as for sale.

Achieving seed security is quite different from attaining food security, despite their obvious links. One can have enough seed to sow a plot, but lack sufficient food to eat, for example during the 'hungry season' prior to harvest. Conversely, a household can have adequate food, but lack access to seed for planting. Despite these important differences between food security and seed security, determinations of seed security are invariably based, implicitly or explicitly, on food security assessments. This results from a lack of appreciation and understanding of seed security issues, caused in part by

The steps needed to attain seed security are quite different from those needed for food security. Explicit seed system security assessments are a prerequisite for effective action and vital for determining the strategic goals for seed-related assistance.

a paucity of methods for assessing seed security in either emergency situations (that is, rapidly) or in depth on a larger scale beyond the community level.

Below we present the basic steps for a seed system security assessment. We note first that the context for any SSSA must first be well understood before one homes in on the agricultural or seed system *per se*. The patterns and causes of the disaster, for example its timing and duration and distribution in space and across communities, have to be analyzed and mapped. Further, the broad

effects on the five capitals (natural, human, social, financial and physical) need to be well understood (see the detailed CIAT/CRS document for a set of guide questions). This brief is restricted to seed security concerns to draw attention to this relatively new area of assessment.

Basic Elements for Assessing Seed System Security

Methods for seed system security assessment are in the process of being tested and refined under the OFDA/MFA-funded Seed Systems under Stress project. A number of basic elements are integral for an accurate assessment of seed security.

Box 1 shows the five main elements in a seed system security analysis, with the subsequent text briefly highlighting key points in each. While presented sequentially, the process is iterative, going back and forth as one starts to understand what is really going on. The analysis is geared

particularly to areas of acute shock (emergency), although most elements would also be relevant for agricultural and seed systems that are more chronically stressed.

STEP 1

Carry Out Quick Farming Systems and Seed System Profile for Regions of Concern: *Normal Times*

As a first step to understanding seed security, one has to have a good grasp of how the farming system and the seed system function in normal times; that is, what was the *status quo*. Much of this information can be gathered pre-disaster, through desk-based research and by informant or focus group interviews. The agricultural and seed system basics are straightforward:

- What are farmers' most important crops in normal times? What do they use them for? Consumption, income or both? What lesser crops might become important in times of stress?
- How do farmers' usually get seed or planting material for these crops?
- What are the sowing basics for each major crop? (Average areas sown, seed rates, multiplication rates.)
- Are there important or preferred varieties, by crop?
- Which inputs and management practices might be essential for particular crops or varieties?
- Who within the household is responsible for decision-making and actual management of the diverse crops, at various stages of production and post-production?

Some of the answers to these questions may be valid across households and socioeconomic groups, while others may not. So, repeating the analysis for distinct types of households or target groups, for example female-headed households, could be important. Some of these answers may also vary by ethnic group, and certainly will vary by agro-ecological region, so that doing an assessment in a small area will not be appropriate for country-wide interventions. We briefly elaborate on several of these items to show how decision-making can start to unfold even in routine information collection.

Important Crops (normal and stress)

Not all crops are equally important for farmers' livelihoods. A quick analysis can highlight the central ones, both for direct consumption and for income (the latter being crucial for purchase of survival

BOX 1 Assessing Seed System Security: Five Basic Elements

1. Carry out quick farming system and seed system profiles for regions of concern: normal times.
2. Determine the goals for seed relief and recovery, including farmer demand and needs: post crisis.

AFTER DYNAMIC DEMANDS AND NEEDS HAVE BEEN DETERMINED:

3. Analyze seed channel functioning post-crisis (framed in relation to demands and needs set).
4. Probe for more chronic (versus acute) stress manifestations as well as for emerging development opportunities – so as to distinguish between immediate and longer-term needs and strategies.
5. Match possible responses to priority constraints, opportunities and demands.

items in times of stress). Note that the profile of crops will change by season. The general profile of crops might also alter in stress periods – and these minor crop variations can usually be anticipated. Finally, as crops critical for poorer farmers may not be the same as for the better off, it is often useful to focus on the more vulnerable population segments immediately.

TABLE 1
Most important crops, theoretical example for East Africa

CROP	For Consumption	For Income	Other (Specify)
Beans	+		
Sorghum	+	+ (beer)	
Maize	+		

How (through which channels) farmers normally obtain seed for these most important crops

Farmers normally get seed from a range of channels, even for the same crop. For example, a farmer might get some of her bean seed from own stocks, and some from local markets to top up inadequate home harvest or storage conditions. The use of multiple seed channels for the same crop is important because a failure of one channel can be compensated for by using another.

Seed for different crops, for example maize and sorghum, may also routinely be accessed through quite different channels. For example, hybrid maize might need to be accessed from the formal sector or commercial sellers, while seed for sorghum can easily be obtained from home harvests because its multiplication rate is high and the harvest can be directly used for seed.

Through time, the range of channels from which farmers access seed may change, as more integrated seed suppliers emerge, such as informal traders who move higher quality (but still not certified) seed. Similarly, with increasingly poverty, relief seed is becoming routine in many contexts. Hence it is

important to be aware of the full range of channels that farmers use and to keep up-to-date on changes over time.

Are there important or preferred varieties (by crop)?

Different varieties may serve different purposes in a single household. While certain varieties may be preferred for home consumption, others may be preferred for sale. Elements of post-harvest processing, such as ease of threshing, may cause women to prefer different varieties from men. The role of different varieties may vary across households, reflecting, *inter alia*, differences in agro-ecological and socio-economic conditions. For example, households with easy access to markets may access fertilizers and pesticides, thereby making a variety with traits such as tolerance to local production constraints (for example pests and poor soils) less relevant. Note also that the relevance of different varieties may change through time, even within a household, for example as socio-economic conditions change.

For many crops, small farmers are increasingly obtaining their seed off-farm through local vendors and markets.

STEP 2

Determine the Goals for Seed Relief and Recovery, Including Farmer Demand and Needs: *Post Crisis*

One of the early steps to shaping a seed system security assessment centers on weighing the objectives for relief and recovery. It is only with this strategic reflection that practitioners increase their chance of meeting the needs of populations in stress. Strategic reflection is vitally important and should replace the simple response of merely delivering inputs such as seed, which may or may

TABLE 2
Seed sources (percent from different sources) for most important crops, theoretical example for East Africa

CROP	Own Production	Social Networks, Neighbors & Friends	Local markets	Formal Sector	Other (Specify)
Beans	50	5	45		
Sorghum	95	5			
Maize	20			80	

A response may do a disservice to stressed populations if it restores a system that is gradually deteriorating.

not be appropriate for the context and, even if appropriate, may not be used for other reasons.

In considering objectives, practitioners may either elect to restore the system to the *status quo ante* (as it was before) or actively aim to promote a different and

presumably improved crop and agricultural system. In planning either thrust, it is necessary to ensure that the response addresses immediate needs and demand. The rationale for this Step 2 is that the aims of the relief and recovery should be considered explicitly – so that the SSSA is shaped to maximize

understanding of the dynamics (constraints and opportunities) in the systems.

Several points merit consideration. First, farming systems are not static: rather they are dynamic and change in positive as well as negative ways. Secondly, one cannot intervene in the full farming system, across all crops; choices have to be made as to whether the crop focus should promote quick recovery or maximize return on investment. Third is the principle of ‘Do No Harm’. A response may do a disservice to stressed populations – reinforcing vulnerability – if it restores a system that is gradually deteriorating. Finally, it has to be made clear from the outset to which groups the SSSA gives priority (Farmers? Seed companies? Traders? Others?)

Box 2 suggests the kinds of guiding questions needed to frame the setting of aims.

BOX 2

Defining a Strategy for Relief and Recovery: *Guide Questions*

The following presents guidance as to whether the goal of the intervention should be to restore the agricultural system to its pre-crisis status quo, or if it should aim at promoting a different (and presumably improved) system.

OVERVIEW

- What are the strengths and weaknesses of the pre-crisis cropping and seed system practices?
- Are the crops and varieties that people can access generally appropriate?
- Do people have access to markets for inputs and produce?
- Are there social networks and institutions that function to diffuse knowledge and planting material?
- Is there a culture of experimentation and evaluation with new seed?
- Are people eager to explore new niches such as seed trading?
- What opportunities exist that can be exploited?
- What changes are already taking place that shape crop and variety profiles, and with what effects?

If strengths and opportunities exist and predominate, an overall aim for any intervention should be to ‘do no harm’. Changing a system may put existing strengths at risk. However, if sound changes are already going on, these changes may be undermined by interventions that aim to restore the pre-crisis status.

GUIDING QUESTIONS FOR RESTORING THE SYSTEM TO THE STATUS QUO ANTE

- If the aim is to restore, should the focus of intervention be on the income-generating crops, the staple crops, or crops that are key for system resilience, and why?
- Which crops have been affected most by the crisis? Should the focus be on these? Why? Why not?

- Are the crops affected critical for immediate food security? Are there no substitutes (or other opportunities) locally to fill the gap?

GUIDING QUESTIONS FOR IMPROVING THE CROP, SEED OR AGRICULTURAL SYSTEM

- What evidence is there that change is needed? What types of change?
- What should the level of effort on strengthening be in relation to efforts on system restoration? What strengths and opportunities exist in the surviving system that can be exploited? (See above)
- Should the crops of intervention focus be the same as before? Why? Should there be a partial combination of old and new crops? Note that the introduction of a new crop implies the identification of a new market.
- Should crop diversification be promoted as an explicit strategy?
- Should the priority varieties of intervention focus be the same as before? Why? Should there be a partial combination of old and new varieties?
- Is there evidence of seed quality concerns? How might these be addressed?
- Is there evidence of accessibility of novel crops and varieties? Bottlenecks, or otherwise, in formal sector, local seed/grain markets and exchange networks?
- What are the risks involved in the strengthening strategy? How might they be anticipated and responded to?

RESPONDING TO IMMEDIATE FARMER DEMAND

Focusing on farmers and local economy trends, is there evidence for shifts in immediate demand and needs?

TABLE 3
Rating the parameters, bean example.

Crop	Availability (high to low)	Access (easy to difficult)	Variety & Physiological Quality (acceptable or not)
Own production and home stocks	low	easy	acceptable
Local grain/seed markets	high	difficult (high price)	moderately acceptable: variety is adapted but seed is of medium physiological quality
Formal Sector	low	difficult	moderately acceptable: variety is not totally suited to marginal zones, but seed is of high physiological quality

STEP 3 Analyze Seed Channel Functioning: Post-Crisis

This step provides the core of the seed system security assessment. Some channels may be more resilient to different kinds of stress than others, and one should not assume that a breakdown in one channel means a breakdown in all. So, for instance, in times of bureaucratic upheaval such as civil war, when government services may halt, formal channels like seed parastatals often cease to function, while local ones, such as the seed/grain markets, often continue to operate.

In assessing seed channel functioning, three basic dimensions of seed security need to be evaluated to understand seed system functioning (see Brief No. 3 and Table 3 above).

Seed availability: Is seed available in the area?

Access to seed: Can farmers access the seed, particularly in terms of price and distance?

Seed quality: Is seed of the right variety? Is it sufficiently clean and healthy? Will use of this seed introduce unwarranted risk?

A channel is functioning (or can be helped to function) only when all three features can be managed to farmers' satisfaction. Very often during a crisis one may have to think hard about how to weigh each of these features. Minimally, enough seed has to be made accessible for basic sowing. The issues often most hotly debated include 'of which crops and varieties', and 'of what quality'.

Key Insights for Assessing Seed Channel Functioning

In the majority of cases, for poorer farmers, two channels in particular merit focus in stress periods: seed sourced from home production and from local seed/grain markets.

Home Production

The important message concerning home production (that is seed derived from own harvests) is that a production shortfall does not necessarily imply a seed shortfall. Crops have different seeding rates (that is, the amount of seed required to sow a given area) and different multiplication rates (that is, the amount of seed harvested in relation to the amount of seed sown). As an example, in East Africa for some of the basic staples, like beans or sorghum, farmers can lose most of the harvest (for beans 88% and for sorghum even 99%) and still have enough seed to sow – assuming all crop harvested can be saved for actual planting. But note that saving seed is not always easy, particularly in areas with only one agricultural season per year.

TABLE 4
The relation between harvests (home production) and seed needed for sowing, theoretical example for East Africa.

Crop	Beans	Sorghum
Surface Area per household	1/4 ha	1/4 ha
Seeding Rates (kg/ha)	100	10
Sowing Needs	25 kg	2.5 kg
Multiplication Rates	8	100
Harvest	200 kg	250 kg
% of harvest needed to meet basic sowing needs	12.5	1.0

Local Markets

Analyses that show how farmers actually obtain seed, both in normal and stress times, also deliver an important message about local markets. For many crops, small farmers are increasingly obtaining their seed through local vendors and markets, either to top up their home supplies, or to obtain the bulk of their seed, because they felt forced (or chose) to eat their household stocks. This trend toward market purchase is being documented again and again as land holdings become smaller and more fragmented, and as soil fertility progressively declines, particularly in East, Central and Southern Africa. The key question for understanding seed security thus shifts from 'do farmers produce enough seed' to 'can farmers access seed elsewhere'. Assessing how markets function involves tracing the locations of seeds and the paths along which seed moves in a stressed region, the availability of seed at important markets, transport and time costs, and the price at which seed is ultimately put on offer locally. Interviews with key regional traders can be especially useful for understanding the position of seed stocks

and price margins (and this can be done quickly). Again, case studies are showing that for most basic crops it is rare that seed is not available within reasonable trading vicinity – even in time of crisis.

STEP 4

Probe for More Chronic (versus Acute) Stress Manifestations as well as for Emerging Development Opportunities

The last key step – before analyzing possible responses – centers on looking at the longer-term, so as to understand what is actually happening at the present moment. If the focus remains on the acute or short-term, SSSA may fail to grasp ongoing processes and dynamism in the system, and subsequently may misdiagnose the real set of local strengths and weaknesses. An SSSA has to systematically probe for longer-term patterns and key signals, which enlighten seed system functioning.

BOX 3

Guide Questions for Looking at the Longer-Term: Chronic Stress? Developmental Opportunities?

SEED AVAILABILITY

- Do farmers lament a general shortage of any seed or planting material of a specific crop, which forces them to plant smaller areas than they wish?
- If so, do they cite reasons for these crops and varieties not being available locally? Marketing problems perhaps? Poor transport? (If farmers complain of high price, or not having funds to buy what is on offer, this reflects a problem of access.)

SEED ACCESSIBILITY

- Do farmers complain of high seed prices, or cost of seed in general, which has forced significant changes in their agricultural strategy, such as planting smaller areas, using non-preferred seed or changing the area planted to different crops?
- Do farmers mention decline of seed bartering networks that gave them access to seed and no local market mechanism to fill the gap and deliver the seed they want?

SEED QUALITY

- Are farmers planting what they consider unadapted (or 'inferior') crop varieties because they cannot find anything better (crops with low yields, wrong cycles, poor taste, poor marketing qualities)?
- Are farmers planting what they consider low quality seed because they cannot find anything better?

- Do farmers continually have to resow fields because of germination or emergence failures?

GENERAL CONCERNS

- Do farmers comment on a decline of seed quantity, quality or accessibility over the longer-term? (Maybe take a 5 to 10 season view.) If so, why? Are these problems they feel they cannot solve?
- Have the farmers been the recipients of seed aid on a repeated and relatively regular basis (say 1 in 3 seasons)? If so, why?
- Are there farmers who exhibit 'positive deviancy'? That is, who always have seed available, who never have a problem accessing seed and who are satisfied with the varieties and the quality of their seed? Why are these farmers seed secure and what can one learn from them?

LOOKING TO THE FUTURE

- Do promising new varieties exist for the agro-ecosystems in question, and do farmers have access to them? (Aim to understand how farmers use new varieties and under what circumstances.)
- Have there been positive trends in crop choice and evolution? If so, for whom? What were the conditions for success and how can these be sustained further?
- Have agro-enterprises been developed regionally? If so, what were the salient features for start up and success? (Try to analyze also those that may have failed.)

Threshold or trigger indicators that might signal chronic stress include:

- Aid is being given season after season, in absence of acute outside stress such as floods.
- Crop failure, and purported lack of seed, becomes cyclical, say every 2 to 3 years.
- Lack of seed stored in houses and communities where it is normally maintained in quantity.
- Dramatic declines in seed quality and viability, or farmers sowing seed that they know to be of significantly inferior quality for germination rate or plant health.
- Changing crop profiles because of a lack of a particular seed or crop.
- Sharp increases in use of non-preferred or disliked varieties.

On the more developmental side, similarly, key

signals can serve to stimulate reflections. Note that possible seed system strengthening might be framed both to respond to existing problems and to explore novel opportunities. In terms of opportunities, trigger signals on the more developmental side might include:

- Lack of farmer awareness of, access to, or use of new varieties (see also Brief No. 5).
- Heavy reliance on a narrow range of subsistence crops.
- Lack of agro-enterprise in general (with most crop production for local consumption and sale).

Box 3 (opposite) suggests guide questions to help assess whether seed systems are stressed on a more chronic basis and to suggest ways to start to explore more developmental options that go beyond short-term responses to emergencies.

TABLE 5
Seed problems and broadly appropriate responses

Parameter of the problem	Short-term response (acute)	Long-term response (chronic)
Unavailability of seed	<i>Where farmers source seed predominately through informal seed channels:</i> Enhance immediate operation of local and regional markets (e.g. offer inventory credit to traders, facilitate improved access to market information, including advance notice of demand subsidies or of purchase). <i>Where farmers source seed predominately through formal seed channels:</i> Direct distribution of seed.	<i>Where farmers source seed predominately through informal seed channels:</i> Support development of local and regional markets (e.g. encourage more access to credit, better established market information channels, perhaps more effective transport and seed storage support). <i>Where farmers source seed predominately through formal seed channels:</i> Support development of quality assured seed production or supply chains, including commercial enterprises where viable.
Poor and vulnerable farmers do not have access to seed	Cash disbursement. Seed Fairs with vouchers or cash. Local procurement and distribution (if the disaster rendered the communities dysfunctional).	Poverty reduction programs.
Seed of poor quality and lack of appropriate varieties	Seed fairs with quality controls. Direct distribution of test samples of quality seed or sale of subsidized test samples. Distribution of foundation seed to a limited number of farmers, making use of informal seed channels to diffuse the seed to others.	Programs to improve seed quality (on farm and in seed/grain markets). Participatory variety selection. Participatory plant breeding.

STEP 5

Match Possible Responses to Priority Constraints, Opportunities and Demand

Finally, the strength of the assessment (its accuracy, comprehensiveness and scope) must be double-checked *via* the reflective process of linking problem definitions and concrete action on the ground. The SSSA should be sufficient to guide subsequent field action and to help weigh among a variety (or cluster) of options. The process of pondering responses will reveal the extent to which information is sufficient, and whether the dynamics of seed system function are truly understood.

Without prescribing a scenario such as 'If A is found, then B response is appropriate', we suggest in Table 5 below the broad overview of possible seed system-related problems and how they may link to possible alleviating actions (see CIAT/CRS ms. for

an in-depth table). For instance, during an acute crisis such as a flood, an assessment that shows a 'lack of seed available' (a rare case) might be immediately linked to actions to import seed from elsewhere, whereas an assessment that diagnoses 'lack of access' as the problem (perhaps due to a drop in ability to purchase or to barter) might focus on supplying vouchers (perhaps coupled with seed fairs). Assessments that show the stress to be a chronic one, spanning many seasons, might recommend a move away from seed-based interventions altogether. In the case of chronic access problems, the development of income-generating activities or agro-enterprises might better help alleviate the poverty problems at hand.

Conclusions

New insights on seed aid and an appreciation of the resilience and complexity of seed systems are emerging. This has resulted in a significant 'raising of the bar' in how seed system security is assessed and analyzed and how seed interventions are designed.

A seed system security assessment, not surprisingly, focuses on seed systems. It therefore does not replace disaster and food security assessments, but rather it complements them. SSSA itself also goes well beyond a seed focus *per se* and beyond reductionist calculations of seed needs. SSSA is an iterative process – part desk-based, part field analysis – with reflections on short- as well as long-term trends in the seed, farming and livelihood systems.

This brief introduces a tool that practitioners can use to assist farming communities recover from disaster. It provides concrete guidance for understanding problems and identifying opportunities for strengthening and integrating the different seed systems on which farm families rely.

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Seed Aid for Seed Security

ADVICE FOR PRACTITIONERS

Seed Relief Responses: *an Overview*

This Brief describes the predominant approaches to seed aid used to respond to acute, emergency stresses. Such approaches generally either deliver direct forms of aid and assume a lack of available seed as the driving need, or are market-based and give recipients cash or vouchers to procure seed and hence assume lack of access as the driving need. (These distinctions are discussed in more detail in Brief No. 3.) This Brief looks at the range of interventions, suggests some of their strengths and weaknesses, and highlights how they are evolving over time.

Direct Aid Approaches

Direct seed aid generally engages implementers in procuring, transporting and distributing seed. Direct Seed Distribution, its main variant, is the oldest form of seed aid and has been practiced, at least in Africa, for more than 20 years. Food aid that is given explicitly to protect seed stocks (known as Seed Protection Rations) might also be included in this category. We briefly discuss these direct aid approaches below.

Direct Seed Distribution

Direct Seed Distribution (DSD) is the dominant approach to seed relief. It is sometimes referred to as seeds and tools (S&T) because the distribution of seed is often accompanied by the provision of a hand hoe, and is also known as conventional seed aid, denoting its longstanding position as the standard response. DSD is a classic supply-side approach; the implementing agency decides what quantities of which crops and varieties to purchase and to distribute as a package to farmers. It is based on an assumption that the problem is a lack of available seed or of seed quality; although seed might be available, it is considered to be of inferior varieties or of poor quality. Tenders are issued for commercial seed, if available in the country, or for farmer seed if not. This might be done by the concerned government, by the Food and Agriculture Organization (FAO) or by non-governmental organizations (NGOs). The transport and distribution of the seed is usually undertaken by NGOs who may already be engaged in distributing relief supplies (food and non-food). DSD approaches differ mainly in the source from which they procure seed – the commercial sector or farmer-based systems (see Bramel et al. 2004).

Commercial Seed-Based DSD

Direct seed distribution based on commercial seed is widely used in countries with a commercial maize seed sector such as Kenya, Malawi, Tanzania, Uganda and Zimbabwe. This may be because governments use the relief opportunity to promote their seed industry. However, it has also been used in southern Sudan, where there is no formal seed system, with seed sourced in neighboring

Responses to seed relief are changing, from a historic dominance of direct seed distribution (previously called seeds & tools) to market-based options. While direct aid assumes 'lack of available seed' as the driving need, the market-based approaches, focus on concerns of 'lack of access.'

Uganda and Kenya. Seed is procured either from government seed parastatals or from private companies who procure certified seed of varieties that have been developed by private or public sector research.

Commercially-based DSD by its nature is restricted to a narrow range of crops and varieties that the seed business sector has deemed potentially profitable. Many of these crop and variety types have been selected for medium and high potential environments, or may be hybrids, because the commercial sector is geared towards those farmers who can afford to pay for new varieties or who seek to renew their seed stocks regularly.

Farmer Seed-Based DSD

Direct Seed Distribution is not based on the commercial sector in countries such as Ethiopia, Eritrea and Burundi because the commercial sector there is nonexistent or too small to meet the relief demand or because the government discourages the importation of seed into the country. In these countries, DSD consists of sourcing seed from the farmers directly, via larger-scale traders, or by purchases in grain markets. In farmer-based DSD (as with commercial-based DSD) implementing agencies decide on crops, varieties and their relative quantities. Tenders are issued, seed is purchased, aggregated, transported and distributed to farmers.

TABLE 1
Range of seed relief approaches used in periods of acute emergency stress

DIRECT AID APPROACHES	
1. Direct Seed Distribution: Commercial-Based a.k.a Convention Seed Aid, Seeds and tools.	Procurement of quality seed from outside the region, for delivery to farmers. The most widely used approach to seed relief. Short-term response best suited to address problems of seed availability especially in situations of total crop failure and long-term displacement of farmers.
2. Direct Seed Distribution: Farmer-based or Local procurement and distribution of seed.	Procurement of quality seed from within the region, for delivery to farmers, a variant of 1. Short-term response to address problems of seed access or highly localized problems of seed availability.
3. Food aid, Seed Protection Ration.	Food aid is often supplied in emergency situations alongside seed aid so that the farming family does not need to consume the seed provided or to eat their remaining seed stocks.
MARKET-BASED AID APPROACHES	
4. Vouchers and cash to farmers.	Vouchers or cash are provided so as to give farmers the means to access seed where it is available, from local markets or the commercial sector. Farmers can access crops and varieties of their choice. Short-term response to address problems of seed access especially in situations of local seed shortages where local markets or barter between farmers are normally used.
5. Seed Fairs.	Seed fairs provide an <i>ad hoc</i> market place to facilitate access to seeds of specific crops and varieties, from other farmers, traders, and the formal sector. Usually used in conjunction with vouchers to provide poorer farmers with purchasing power. Short or medium-term response to address problems of seed access especially for subsistence crops, and where local markets are normally used.
6. Trade-Input, Multi-Input, Livelihood Fairs.	A variant of 5. In addition to seed, such fairs facilitate farmers' access to inputs such as small livestock, animal feed, fertilizer and tools.

The fact that seed can be successfully sourced from the farmer seed system during direct seed distributions provides *prima facie* evidence that there is no problem of seed availability in the countries and regions in question, although there may be pockets of problems, for which local procurement is necessary. Supply-side interventions like DSD are generally misplaced in such situations.

Food Aid and Seed Protection Rations

The delivery of food aid may be underrated as a seed relief strategy. Delivery of food aid can allow farmers to retain, rather than eat, their remaining seed stocks. The rationale for the Seed Protection Ration is that such food aid is given particularly for the months prior to sowing, during the lean times.

Market-Based Approaches

Market-based approaches focus on giving farmers the means to obtain seed. They are based on the assumption that seed access, not seed availability, is the primary constraint. The use of seed vouchers, coupled with seed fairs, is the most common response in this genre. The seed focus has also recently expanded to embrace 'Trade-Input' or 'Multi-Input' or 'Livelihood' Fairs. Furthermore, giving vouchers or cash alone, without an accompanying fair, is increasingly being practiced as a seed aid strategy.

Seed Vouchers and Fairs

Seed vouchers are coupons or certificates with a guaranteed cash value that can be exchanged for seed from approved sellers. Seed sellers then redeem their vouchers for cash from the issuing agency. The Seed Voucher and Fair approach (SV&F) brings seed sellers together on a specific set of days and in a well-advertised local venue and then allows farmers who need seeds to select the crops and varieties they want. The SV&F approach is fairly recent in terms of an emergency response and was first implemented in July 2000 in Kenya (see Remington et al. 2002). However, its use has been scaled up quickly and as of 2005 had been implemented in some 30 African countries.

Trade-Input, Multi-Input or Livelihood Fairs

Several variants on seed fairs give farmers access to a range of inputs beyond seed, such as small livestock, animal feed, fertilizer and tools. Vouchers are issued, and sellers and buyers come together in dedicated aid events.

Cash or Vouchers Alone

Voucher distribution alone has been used in a range of aid contexts, for services as well as goods: medicines, tools, food and other items vulnerable

populations might need. Their use linked to seed is somewhat more recent, and ultimately allows the recipients to decide whether seed of any kind is a priority for them.

Cash-based aid also has been around for decades, but work comparing the effectiveness of cash to vouchers and to direct aid approaches is fairly new. The first conclusions suggest that direct cash compares favorably with all alternatives, including food aid itself (see Harvey 2005).

Table 1 summarizes the range of seed relief approaches used in periods of acute emergency stress. (Modified from Anon. 2004 FAO).

Comparing the Dominant Forms of Aid: DSD and SV&F

No one approach to seed aid is inherently better than another. Much depends on features such as the nature of the emergency (man-made or natural), the seed security problems encountered and the capacities of the implementing agencies. Below we outline some of the salient advantages and disadvantages associated with the two dominant forms of seed aid: Direct Seed Distribution and Seed Vouchers & Fairs.

Advantages

Main advantages of Direct Seed Distribution:

1. It exploits the existing disaster relief system and capacity.

Governments, donors and relief agencies have well established procurement processes and accountability systems. Seed can be treated as any other commodity, such as food, blankets, tarpaulins etc. Tenders are issued, sealed bids accepted, seed is purchased, transported and distributed.

2. It is easy to scale up quickly.

If seed is available, it can be sourced, transported and distributed to large numbers of farmers in a short period of time.

3. It supports the formal seed system.

The purchase of commercial seed is very profitable to seed companies because orders are large, NGOs pay up front and they also handle transport and distribution. It is especially lucrative when seed companies can purchase and condition grain to sell as 'emergency grade' seed.

4. It is an opportunity to finance the large scale dissemination of seed of new promising research varieties.

Seed of new varieties reaches many more farmers more quickly than through the commercial channels.

Main advantages of Seed Vouchers & Fairs:

1. SV&F builds and strengthens local farmer systems.

Although recovering from disaster, demand by farmers for seed is usually constrained by their lack of financial capital. Increasing demand by issuing vouchers enables farmers to access seed from a range of sources such as other farmers, market traders and the commercial seed sector. When managed by competent staff, seed fairs provide an opportunity to identify ways to strengthen seed systems by supporting seed production, marketing and system integration.

2. SV&F increases financial and social capital in the target communities.

Unlike DSD, where seed companies, procurement agencies, large traders and transporters capture most of the benefit, the proceeds from the sale of seed is shared mostly among community-based traders (many of whom are women). This results in increased financial and social capital in the communities.

3. SV&F strengthens the integration of the formal and farmer seed systems.

SV&F provides an opportunity for sellers of commercial and farmer seed to compete for customers. Where commercial seed companies or stockists have been represented at fairs, farmers have often opted to spend at least a portion of their vouchers on commercial seed, for example on hybrid maize or on a new variety of bean or pigeonpea.

4. SV&F gives farmers relative choice of crop and varieties.

A diversity of crops and varieties are on offer at seed fairs, usually reflecting the predominant crops sold also at local seed/grain markets. Farmers have the option to use their vouchers to obtain crops and varieties of particular interest and to access multiple types of seed.

Disadvantages

Main disadvantages of Direct Seed Distribution:

1. The approach tends to be top down and centralized.

DSD is generally not planned and implemented with communities. As a supply-side approach, the implementers tend to make the major decisions on seed procurement and distribution.

2. There are important risks of wrong varieties or crops.

Because seed is sourced either commercially or in bulk, a narrow range of crops and varieties

tend to be on offer in DSD. Particularly where companies and seed parastatals are targeted towards medium and higher potential farming areas, the crops and varieties on offer for emergency may not be suitable for the conditions of vulnerable or marginal small farmers.

3. The large scale of seed acquisition results in a skewed distribution of benefits.

Mega-tendering (that is purchasing large amounts of seed) means mega-profit for the successful bidders and transporters. The value of the seed received by farmers is but a small fraction of the total project cost.

4. Emergency DSD purchase undermines market functioning.

The free delivery of seed, directly and on a large scale, undermines the functioning of local seed/grain markets and compromises the development of longer-term more commercial seed supply systems. Furthermore, while DSD can be quite profitable for seed companies, such enterprises often opt for sales to emergency NGOs after a disaster and may neglect their network of rural stockists and customers.

Main disadvantages of Seed Vouchers & Fairs:

1. The approach is difficult to implement quickly and to scale up.

SV&F is decentralized and management intensive. Many NGOs have never implemented SV&F and so they require training, which takes time. Each fair can serve on average only 500 farmers – which means that multiple teams have to operate concurrently and for several weeks to reach even 10,000 farmers.

2. SV&F requires knowledge and capacity of seed systems.

Unlike DSD, SV&Fs are not once-off distributions. Rather they are the start of a process of relief, recovery and development that spans three years or more. This process requires competent and dedicated agriculture staff, which most relief agencies currently lack.

3. SV&F practitioners have less access to seed of commercial and researcher varieties.

Given a choice, seed companies will prefer DSD over SV&F. In DSD the relief agency is the customer and relief agencies are ideal customers because they place large orders, always pay on time and rarely complain. In contrast, reaching rural farmers is expensive and risky because smallholders may decide not to purchase the more expensive commercial seed.

Concerns Common to Both: Seed Quality

It is essential that the seed delivered by seed aid is of acceptable quality, so that it can hasten the process of recovery. Concerns about quality are often at the heart of critiques of both approaches, DSD and SV&F.

Stereotypes often judge seed from the formal or commercial sector as high quality, healthy and having high germination, while seed from the informal sector (home-produced and procured from the market) is deemed of poor seed quality.

However, grounded analyses show that such labels can be deceptive (see Brief No. 2). The health quality of formal-sector seed may not be as advertised, while at the same time select laboratory analyses have demonstrated good quality in farmer seed and market seed (western Kenya case). Overall, emergency-grade seed is variable in health and genetic quality (eastern Kenya case). The point is not to assume the quality of seed from a given source because of the source. Other methods may be needed to verify standards.

The focus on seed health as a measure of quality in emergency seed aid has diverted attention from what is probably the more important quality issue: suitability. The seed on offer must be adapted to the growing and stress conditions at hand, and should have generally acceptable crop characteristics. It is puzzling that genetic quality has in practice been given second priority in emergency responses. While relatively few crops and varieties are multiplied by the formal sector, those emerging from formal research sectors or on offer from commercial companies are assumed to be good enough for emergency distribution, regardless of whether they have been selected for use in the regions of stress, can be grown under the management conditions actually practiced by farmers, or are acceptable to those preparing food. On this last point, farmers may be given orange-fleshed sweet potatoes or yellow maize when cultural preferences abhor such choices, preferring white sweet potatoes or white maize. In the relief business there are often trade-offs between accessing seed with locally-accepted agronomic and consumer qualities *versus* seed with highly defined health and viability standards.

Looking Forward: Direct versus Market-Based Aid

Concern has been growing among donors, agriculture researchers and NGO practitioners that Direct Seed Distribution has become repetitive and is expensive, with little impact beyond the few kilograms of seed received by farmers. In addition, evidence is accumulating that the seed security problem is often not one of seed availability or

quality, but rather of lack of access to seed. Hence there is now increased interest in the use of a range of market-based approaches to emergency seed aid.

With growing donor support (particularly from the Office of Foreign Disaster Assistance/ USAID), large NGOs such as CRS, CARE, World Vision International, and Save the Children UK are increasingly using Seed Vouchers & Fairs in their relief and recovery efforts. One of the more dramatic shifts to date has been in Mozambique, where the government has dropped DSD and shifted to vouchers with support from the International Center for Research in the Semi-Arid Tropics (ICRISAT) and FAO.

There are a number of important challenges related to SV&F implementation, including the requirement for increased agricultural technical competence, the need to engage the formal seed sector – especially agricultural research – to

enable farmers to access seed of new and promising varieties, and the pull for SV&F to remain innovative and not become stagnant or repetitive. Relief agencies that want to implement SV&F need to hire, train and retain competent agricultural staff. This will not be easy as many agencies have no agriculture capacity and treat seed as they would any other relief commodity. Furthermore, in order to give farmers access to seed of new and promising varieties at seed fairs, research organizations will also need support to ensure that seed is multiplied and on offer at the fairs. Finally, effective monitoring and evaluation and

Direct seed distribution is easy to scale up, supports the formal sector and can be used to disseminate new varieties widely. Seed vouchers and fairs strengthen local systems and strengthen social and financial capital in communities. They offer farmers more choice (of both local and new crops and varieties) and can pave the way for integration between formal and informal systems.

timely reporting are needed to continue to capture opportunities created by SV&F.

The increasing use of vouchers and direct cash approaches more generally to address the problem of lack of access is both a promising sign and a strong signal. Homing in on the problem of access and letting farmers make their emergency choices should enhance the odds that immediate aid meets priority needs. However, the recognition that concerns about access are central should serve to help shift aid away from emergency responses altogether for seed and non-seed. The inability to access a good is one of the problems of basic poverty. Hence, the scope of assistance needs to go well beyond emergency aid, and towards approaches that strengthen basic livelihood strategies, for example agro-enterprise and income generation programs.

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Seed Aid for Seed Security

ADVICE FOR PRACTITIONERS

The Power of Evaluation

The current state of evaluation in seed aid is dismal indeed. In principle at least, practitioners understand and embrace the importance of evaluation in learning from experience and improving performance. Unfortunately, however, seed interventions are often seen as straightforward, one-off, and output focused: react quickly, distribute seed and close out. Evaluations are not relevant.

This attitude has resulted in a remarkable stagnation in how seed security is understood and assessed and how interventions are planned and implemented. Fortunately, ideas are changing. With a growing realization that seed systems are complex and resilient and that local institutions – especially markets – can and should play a central role in recovery, initial seed aid responses are now seen as the first important step in an ongoing process that may last many years. Evaluation has become essential to ensure that experience leads to learning and that learning informs the next step in the process. This will lead to better projects, which in turn will result in stronger and more resilient seed systems that underpin sustainable seed security. Evaluations should help to correct common and immediate problems such as poor targeting, unsuitable crops or varieties on offer and dependency creation.

Rather than turning their attention to evaluation at the end of implementation, practitioners should reflect on the evaluation when designing the intervention. What should be the outcomes of the intervention and for whom? For how long, and at what intervals, will the agency need to monitor the range of effects of its assistance? Time and budget commitments should be made accordingly.

Practitioners should embrace evaluation as an exceptional learning opportunity.

Donors need to support practitioners in contributing to the body of knowledge, rather than merely holding them accountable for mistakes made.

Types of evaluation

There are several different types of evaluations.

Real time evaluations

One can use interviews, for example just after seed distribution or as people leave seed fairs, to obtain feedback from beneficiaries. This feedback is then used immediately to inform the next planned 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 (within one month) to provide feedback from practitioners, partners and beneficiaries on the logistics of the intervention (its timing, targeting, distribution mode, etc.). This is the classic type of post-mortem evaluation that satisfies donor requirements and closes a project.

Outcome evaluations

At the end of the cropping season interviews evaluate the effectiveness or outcome of the intervention in terms of impact on crop production and next

season's seed security. An outcome evaluation shifts the focus from what was done (outputs) to what might be done next to support continuing recovery.

Impact evaluations

Longer term follow up, conducted after three to five seasons, aims to evaluate the broader impact of the interventions on seed system resilience and food security. This type of evaluation seeks to capture and share learning and best practices for the wider practitioner community.

Meta-analyses and evaluations

This type of evaluation compares several interventions at once. The interventions may be of the same type (for instance, a range of direct seed distributions) or they may represent different approaches, such as direct seed distribution and seed vouchers and fairs. 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

Evaluations must address concerns of basic intervention effectiveness. Have activities made a difference to farmers, farming systems and the local economy?

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 by deepening their understanding of seed systems and the strengths and weaknesses of different kinds of response.

Evaluation as the cornerstone of learning

Evaluations present a wonderful opportunity for learning – first and foremost for the implementers but also for the wider practitioner and donor communities. The challenge for practitioners is to stop treating evaluations as an onerous requirement and to recognize them as the exceptional learning opportunities that they are. The discussion of whether evaluations should be internal or external misses the point – which is that they should focus on learning. That requires the practitioners to be actively involved in the evaluation with the intention of using the results to improve practices. Therefore,

perhaps one of the better models involves an externally-facilitated evaluation.

Although donors accept output-focused post mortems, they also support rigorous outcome evaluations. The challenge for seed aid donors is to become more proactive in supporting evaluation. This will require donors to embrace learning and sharing as the principle objectives of evaluation, rather than regarding evaluation as simply reporting and closing. Donors need to communicate their support for learning-focused evaluations. They should shift their focus from holding practitioners accountable for mistakes made to supporting practitioners in contributing to the body of knowledge on seed assistance. It is also vital that donors give attention to how those implementing – and everyone else involved in seed aid – subsequently apply the lessons learned during the evaluation.

Guide Questions for Different Types of Evaluation

In the table opposite we suggest some of the varied issues that might be embraced by the different types of evaluations introduced in the previous section. The list is suggestive, to give examples of key issues at different levels of evaluation, and is a long way from being exhaustive. What is important is to emphasize that:

- The key evaluation issues change through time.
- All four types of evaluations are important and are not interchangeable.
- The recipients' views and actual effects on the ground have to figure among the essential elements.

Note that current evaluation and monitoring, if done at all within seed aid projects, is generally limited to the inputs distributed and the efficiencies of the operation (its timeliness and numbers of beneficiaries reached). Evaluations have to address concerns of basic intervention effectiveness, such as whether the precise activities made a difference to the farmers in the farming system and more broadly to the local economy. While the insights of implementers are important for improving practice, the recipients' point of view should be given equal weight; to do so requires considerable field time to be allocated for evaluation.

To reiterate, evaluations at all levels present important opportunities for learning and thus to improve practice. However, such evaluations require real reflection and commitment as well as time, energy and financial resources. In completing the cycle, practitioners have to be prepared to use the results for specific projects and to incorporate their wider lessons into future program design.

TABLE 1
Themes to address in evaluation

Seed System Relief and Evaluation Overview: Select themes to be addressed		
Type of Evaluation	Agency's assessments of	Recipients' assessments of
Real-time (during intervention)	Insights (from diverse perspectives) on: ■ Products on offer (crop and variety choice, seed quality, seed amounts) ■ The immediate intervention process, whatever recipients signal as important, e.g. • Length of intervention, including waiting time • Number and order of farmers served • Adequacy of support personnel	
Output (after about one-month)	Insights (from diverse perspectives) on the efficiency, organization and logistics of intervention. ■ Timing (especially in relation to subsequent planting) ■ Targeting (process and perceived 'fairness') ■ Choice of locales ■ Choice of crops and varieties ■ Adequacy of seed quality on offer (and validity of process guiding quality verification) ■ Adequacy of preparatory information or sessions ■ Scale (numbers served, overall amounts of seed or products delivered or made accessible) What worked? What was missing? What modifications should be made in future?	
Outcome (after first season)	Insights on first effects of intervention. Recipient Focus: ■ Yield performance and farmer satisfaction with crops and varieties obtained as aid (qualitative and quantitative variety attributes) ■ Importance of seed aid in relation to farmers' other seed sources • What proportion of the aid given was sown and why? • What proportion of the total seed sown came from aid (versus home-saved seed, local markets, exchange) and why? Farming System and Implementer Focus: ■ Was the impact of the disaster on farming systems sufficiently understood to guide planning (looking with hindsight)? ■ Was the general choice of intervention valid (and linked to a specific seed security need?) ■ Was the intervention actually needed? Evidence? ■ Did the intervention strengthen or protect seed security? Evidence? ■ Which broad groups were reached by the intervention and which not? ■ Were there any unanticipated positive effects? ■ Were there any unanticipated negative effects? What worked? What was missing? What modifications should be made in future?	
Impact evaluations (after several seasons)	Impact – positive and negative – of intervention on: ■ Stability of production and food security ■ Biodiversity of crops and varieties ■ Household income and local economy ■ Seed channel functioning, including local seed/grain markets and development of commercial enterprises ■ System resilience to possible next set of shocks	

CONTINUED ON PAGE 4

Seed System Relief and Evaluation Overview: Select themes to be addressed

Type of Evaluation	Agency's assessments of	Recipients' assessments of
Meta-analyses (after cluster of interventions completed)	Content here would vary according to what is being compared. Some general guide themes. Strengths and weakness of a specific type of intervention (e.g. Direct Seed Distribution) for specific contexts (e.g. civil strife, flood, drought). ■ For whom? • farmers – male – female • children • traders • commercial companies ■ immediate effects • range of benefits and costs – agronomic – environmental – economic – social ■ longer-term effects • range of benefits and costs – agronomic – environmental – economic – social Comparative advantages among different interventions (e.g. cash and voucher delivery, direct seed distribution, seed vouchers and fairs, seed protection rations) ■ Which contexts? ■ For whom? ■ Immediate effects? ■ Longer-term effects?	

Seed Aid for Seed Security

ADVICE FOR PRACTITIONERS

Developing a Seed-Aid Proposal: *A Rapid Review Checklist for Practitioners*

Working through a set of guiding criteria, practitioners can ensure that any proposals for implementing seed system support are well-grounded and stand a good chance of achieving their objectives.

Disaster has a devastating impact on agricultural livelihoods and often demands support in the food security sector. Even as immediate needs are being considered, attention turns to supporting agricultural recovery, and that often includes seed assistance. The design of these seed-aid proposals is challenging for three reasons: seed interventions are complex and context-specific, especially so following a disaster; time is short as seed is needed before the next planting season; and the implementing agency best placed to respond often lacks experience and expertise in seed systems and seed security analysis.

This rapid review checklist is intended to assist practitioner agencies to review and provide feedback to people who are developing proposals focused on seed security. It can help to determine whether proposals have exploited the seed-assistance body of knowledge, whether they are grounded in an understanding and appreciation of farmer systems and capacity, and whether they reflect better seed-aid practices. Proposal writers too can use it to determine whether they have covered the major topics before prescribing a response of seed aid. It can also be used by donors to complement other project review guidance.

The checklist highlights issues that are unique and critical for guiding seed security strategy and the design of broad seed system interventions. It is emphatically not a 'how to do seed aid' manual. The Table overleaf presents the various elements of the checklist. Each of the assessment criteria is then discussed in more detail.

TABLE 1
Rapid Review Checklist

CRITERIA		Y	N	Further Needs/Comments
Assessments				
1	Is the disaster sufficiently well described, in terms of scope and detail, to provide context for the intervention?			
2	Have the <i>ex ante</i> cropping systems been adequately and accurately described?			
3	Have the <i>ex ante</i> seed systems been adequately and accurately described?			
4	Is the diagnosis of the impact of the disaster on seed security supported?			
5	From the assessment, does it appear appropriate and feasible to consider a farming-related intervention within the period specified?			
Intervention Objectives and Strategy				
6	Are the proposed objectives for seed-related assistance clear?			
7	Do the objectives and proposed strategy address the seed security problem? • short term • longer term			
8	Is the proposed strategy sound and supported by past experience?			
9	Have the populations needing seed-related assistance been adequately defined?			
10	Are the choices for seed channels clearly explained and justified? (Distinguish between seed multiplication and distribution, if appropriate.)			
Implementation and Activity programming				
11	If seed is to be made available through some form of aid, are the activities for ensuring variety and seed quality explicit and sufficient?			
12	Are monitoring, evaluation and reporting planned and budgeted? (Distinguish short-term focus on outputs and longer-term focus on impact and learning.)			
13	Is an exit strategy articulated?			
14	Does the proposal engage and empower women and communities?			
15	Is there the required expertise and capacity to achieve the objectives (both within the institution and <i>via</i> collaborators)?			
16	Is the timing feasible to achieve the objectives?			
17	Have possible negative effects been anticipated (with necessary actions programmed)?			

Explanation of Review Criteria

1. Is the disaster sufficiently well described, in terms of scope and detail, to provide context for the intervention?

Before focusing on the seed or agricultural systems, one needs to have an overview of the effects of the disaster, to assess whether an agricultural intervention is warranted at all. Obviously, the scale and scope of the disaster need to be understood, including details of the people and regions affected. For seed-related interventions, the heterogeneity of impact is particularly important, because less-affected regions may provide useful supplies of locally-adapted seed. Some guiding questions: Is there reason to believe that the agricultural system was affected?

- Did the stress affect natural capital?
 - Land degradation (soil erosion)
 - Access to land (in cases of conflict and displacement)
 - Water shortage (drought)
- Did the stress affect human capital associated with agriculture?
 - Was there large loss of agricultural knowledge and labor due to death, displacement or migration?
- Did the stress affect social capital associated with agriculture?
 - Did war, civil strife, political tensions mean that labor sharing, seed exchange or cooperative arrangements may be altered?
- Did the stress change financial arrangements, for example access to agricultural credit or increases in debt?
- Did the stress potentially affect physical capital?
 - Loss of productive assets; draft animals, tools, granaries, crops and livestock
 - Loss of domestic assets; homes, furnishing
 - Loss of roads to market and damage to bridges
 - Market function disrupted

2. Have the *ex ante* cropping systems been adequately and accurately described?

An understanding and appreciation of the existing cropping systems, before the stress or shock, needs to inform proposal development (whether or not one aims to maintain the pre-crisis status quo). The types of crops and varieties grown, their seasonality, and their end uses (for home consumption, income or both) are important kinds of information. Not all crops are equally important for farmers' livelihoods, and the profile of crops critical for poorer farmers may not be the same as for the better off. Input use and special management practices should also be noted.

3. Have the *ex ante* seed systems been adequately and accurately described?

Understanding the existing seed systems that farmers use in the target area informs the design of recovery activities. There is a better chance that recovery will be rapid and sustainable when an intervention is grounded in the dominant seed systems. Practitioners often source seed directly from the commercial seed sector in spite of the fact that poor farm families do not normally purchase commercial seed, because of the crops and varieties on offer and the cost. Farmers may normally get their seed from a range of channels: home production, local markets or from neighbors, and sometimes from more formal seed sellers as systems intensify. It is also important to understand that a disaster impacts each of these seed channels differently, some being more resilient than others.

4. Is the diagnosis of the impact of the disaster on seed security valid?

Seed security needs to be diagnosed independently of food security, as the two are not always highly correlated. Households can have enough seed to sow a plot, but very little to eat at any one time.

Conversely, households can have adequate food, but lack access to the seed they need to make their plots productive. In assessing disaster impacts, quick deductions also need to be avoided, particularly the false notion that a drop in harvest, or production shortfall, automatically means that there is a seed shortfall. Similarly, when there is food insecurity, it is important not to hastily conclude that farm families have eaten all their seed. Seed insecurity can generally be understood as a problem of availability, a problem of access (related often to cost of seed) or a problem of seed quality or a lack of preferred crops and especially varieties. These problems also have to be framed as either short term (acute) or long term (chronic).

A solid aid proposal builds from an understanding of seed systems and crop systems before as well as after the disaster. Recovery can be rapid and sustainable only when interventions work to support the dominant functioning systems.

5. From the assessment, does it appear appropriate and feasible to consider a farming-related intervention within the period specified?

Are the people affected by the disaster otherwise seed secure? Are farmers confident that stability (security) is all they need to enable them to successfully cultivate and harvest? Do they have sufficient access to fields and other means of production (such as labor) to follow through an agricultural season? Are they willing to re-engage in agriculture?

6. Are the proposed objectives for seed aid clear and do they address the seed security problem?

In reflecting on relief and recovery objectives, several points are important. Farming systems are not static; they change continuously in positive as well as negative ways. Furthermore, the demands of farmers for the things they need immediately, and which can spur them to recovery, should also be put in focus. The default objective is usually to facilitate the quick return of the cropping system to the *status quo ante*. If this is the chosen strategy, the strengths and weaknesses of the existing system should be understood, and built on

Seed system proposals need to be reviewed not only in terms of what they can strengthen, but also in terms of what they may damage.

accordingly. (Similarly, choices need to be made of the crops to focus on. Those most affected? Income generating crops? Crops for quick food recovery?) When a different objective is proposed, such as strengthening or improving the seed or crop system, perhaps by introducing new crops and varieties, this needs to be explained and justified in the context of an emergency response. In all cases, the risks involved need to be carefully analyzed.

7. Do the objectives and proposed strategy address the seed security problem, in the short and the long term?

A clear diagnosis of seed security status and a vision of whether the system should stay as it is or evolve should then lead to a set of activities that addresses the problems at hand. Are there clear links between the identified seed problem and the

cluster of proposed relief activities? For instance, if the objective is to ensure that farmers have seed to plant in conditions of chronic drought, are the choice of crop and variety and the chosen seed system channel appropriate? Emergency proposals are by definition focused on response and short-term recovery. However, it is important that they be designed within the context of what was in the past and what is desired in the future.

8. Is the proposed strategy sound and supported by past experience?

This simple criterion is important because it indicates whether the practitioner is grounded in relevant past experience, either direct experience or indirect experience gathered from the growing body of knowledge on better seed-aid practices. More of the same may not be what is needed. In some cases capacity building (to test new options) may have to be built into proposal development.

9. Have the populations needing seed-related assistance been adequately defined?

Seed is a relatively expensive commodity because only certain types are adapted and not all available seed will be of adequate quality. Targeting those who require seeds (as opposed to those who need food) can be important for ensuring that supplies are adequate. Defining target groups is also important in determining which crops and varieties to give prominence. Women's needs and preferences may differ from those of men; different ethnic groups may have different needs, as will those geared to growing for market compared to those growing for subsistence.

10. Are the choices of seed channels clearly explained and justified?

Individual farmers use seed channels differently, at different times and to differing degrees, to obtain seed of different crops and varieties. Some farmers use their own saved seed or seed obtained from neighbors for certain crops, others rely on the market for those same crops and still others prefer to purchase and plant commercial seed. Disaster influences farmer demand for seed from different channels for several reasons; lack of seed in a preferred channel, increase in price, lack of cash to purchase seed. The choice of a seed channel for aid must be grounded in an analysis of what farmers need in times of crisis, rather than being based on possibly vested interests on the supply side. Multiplication of seed, if programmed within the proposal, needs to be consciously designed from the beginning with an explicit linkage between production and distribution and marketing.

11. If seed is to be made available through some form of aid, are the activities for ensuring variety and seed quality explicit and sufficient?

There are no absolute rules about what types of crops or varieties or what quality of seed should be given in an emergency. Ironically, donor demands rather than farmer needs sometimes dictate this critical item. Minimally, what is given or offered in a crisis should be at least as good and trustworthy as what farmers normally use. The proposal should show some evidence that what is on offer will do no harm and, more positively, that it may actually spur farmers onto a path of recovery. Involving farming communities and specific target groups in these critical choices increases the chances that seed given as aid will actually be sown and will subsequently grow and yield.

12. Are monitoring, evaluation and reporting planned and budgeted?

In responding to an emergency, time may not be taken for rigorous monitoring, thoughtful evaluation and effective reporting. This has often been the case with seed aid, as year follows year of repetitive seed aid with no change in knowledge, attitudes or practice. Monitoring and evaluation have to go beyond an analysis of efficiency, focused on inputs, whether they were delivered on time and how many people were reached. They have to address basic issues of effectiveness: whether the activities made a difference to the farming system, perhaps in terms of crops and varieties, and more broadly to the local economy. Negative and positive reflections are equally important and integral to evaluation.

13. Is an exit strategy articulated?

There need to be benchmarks to seed system assistance beyond the delivery of seed. At some point, one should be able to exit from emergency activity and begin to program real development. Seed deliveries that last more than three or four seasons signal that aid action is off-course.

14. Does the proposal engage and empower women and communities?

Enabling communities to participate in their own development is always a challenge. Involving them in their own recovery from disaster is even more so. Nevertheless, it is important to engage communities in articulating the problem, identifying solutions, planning, implementing, monitoring and evaluating. Women often play key roles in managing varieties and seed selection on farm, and in many regions (particularly in Africa) they are key sellers in local seed/grain markets. An intervention that empowers

women results in quicker recovery and strengthens their traditional roles in seed systems.

15. Is there the required expertise and capacity to achieve the objectives (both within the institution and via collaborators)?

Seed aid is not a logistical exercise and is distinctly different from food aid. Such aid, better phrased as 'seed system support', intervenes at the heart of an agricultural system, makes use of farmers' land and labor at a risky and perhaps unstable period, and may have effects for seasons to come. Seed-aid planning demands sound technical expertise and strategic farming-system thinking. Even during an emergency, it also requires a longer-term perspective. Agricultural expertise has to guide the center of seed assistance development (i.e. support should be cut to those who buy and distribute seed – and then move on to the next relief activity).

16. Is the timing feasible to achieve the objectives?

The pivotal issue is to ensure that farmers have seed in time, not only for planting but also in time to strategize about which crops and which varieties to plant in which fields. This means that seed has to be in farmers' hands several weeks prior to sowing. Does the implementing agency have time to complete the range of logistical issues and still deliver seed far enough in advance of planting? Issues such as proposal review and responding to feedback, coordination among implementers, acquiring any needed inputs, field staff coordination, and interaction with communities and local authorities all need to be considered to assess whether the timing is feasible.

17. Have possible negative effects been anticipated (with necessary actions programmed)?

Finally, seed interventions are a serious business. If done poorly and repetitively they can create dependencies, increase the risk of harvest failure, negatively change agrobiodiversity profiles and undermine functioning seed markets. Proposals need to be reviewed not only in terms of what they may strengthen but also in terms of what they may damage.

FOR FURTHER INFORMATION:

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