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**Emergency Seed Aid in Kenya:  
 some case study insights on lessons learned during the 1990's**

**Louise Sperling**

International Center for Tropical Agriculture

Abstract

This article reviews the effectiveness of seed aid distributions in Kenya during the 1990s. It analyses the *internal process and effects*, i.e. the performance of the aid itself as well as the *external process and effects*, i.e. how seed-aid intervention affected farmers' broader agricultural management strategies. During the drought emergency of 1997, Kenyan farmers favorably judged many of the immediate seed aid features such as crop/variety appropriateness and seed quality---even through the overarching goals of the seed assistance were muddled, ranging from assistance to the poor, to generalized gift-giving to stimulating progressive farming practice. However, the longer-term analyses, drawn from recollections of a decade of relief activity, showed no concrete evidence that seed aid, *per se*, had strengthened their farmer systems, nor that those who have received it once were less likely to receive it again. Thus, while seed aid has been promoted to lessen the effects of an 'acute' stress, drought, Kenyan farmers, in practice, have been experiencing much wider, 'chronic' seed system problems. This article ends by exploring this distinction between acute and chronic seed system stress and suggests a range of interventions appropriate to each.

*Keywords: Kenya, drought, seed aid, seed insecurity (acute and chronic)*

**INTRODUCTION**

Every country in the East and Central Africa has witnessed drought, civil disturbance, or both within the last 10 years, with many regions having experienced such disruptions on a near continuous basis (for example, the Democratic Republic of the Congo, Burundi, and northern Rwanda.) One response to this instability has been the increasing and even constant delivery of seed aid to the region. Although 'seed and tools' is a relatively new assistance approach (probably first implemented around 1990) (ODI, 1996), The Food and Agriculture Organization (FAO) estimates that, by the mid-1990s, upwards of \$10 million per year was being spent in this Greater Horn of Africa area ---just for the procurement of seed for emergency projects (Chemonics, 1996).

**Context**

Kenya is no exception to this aid-recipient trend and droughts of the last decade (eg 1991-2, 1994, 1996-7, 1998-9) have resulted in repeated and widespread distributions of emergency seed. Since 1993, when the Government's Emergency Drought Recovery Programme (EDRP) was formed to address drought issues in arid and semi-arid areas, seed-aid has been delivered on a yearly basis across a broad range of Kenyan sites. The focus has been heavily on maize seed distribution, across agro-ecological regions and through the years.

Seed aid may be rather ‘new’ to Kenya, but the phenomenon of drought is not. One specialist describes 18 significant droughts in the century between 1883 and 1984—about one every 5 1/2 years (Downing et al. 1989). Most evidently, drought is related to fluctuations in weather patterns and, subsequent local water availability. Equally important is that this ‘lack’ of water is linked to the spatial and temporal resources that communities can access. (Sandford 1979) Landholdings in Kenya have steadily decreased over the last 30 years, with per capita income dropping from \$400 in 1963 to \$US 280 in 1999 (Mwangi, 2000). *Drought*, or its acute effects, are becoming more common because farming systems, and particularly poorer farm holdings, are increasingly less resilient ---with less land, fewer crops, and less, little, or no surplus to store.

### **Aims and structure**

This article draws from a consultancy report which reviewed the effectiveness of seed aid distribution in Kenya. The immediate emphasis was on aid delivered during the Long Rains 1997 (February to June)<sup>i</sup>, but it also gained insight from the decade-long history of recurrent emergency seed assistance.

The article starts by describing the methodology used and then divides the next section, ‘Findings’, into two distinct parts. One examines the internal process and effects of seed aid delivered during the Long Rains 1997; a subsequent analysis reflects on the external process and effects:

*Internal process and effects* refers to issues such as the appropriateness of the crops and varieties distributed, the timing of delivery and the targeting of seed-aid recipients. It closely relates to the overall design and implementation of the aid program.

*External process and effects* examines how the seed-aid intervention affected farmers’ broader agricultural management strategies and whether it helped farmers get back on their feet. The analysis goes beyond specific aid program objectives to address wider system sustainability impacts.

This article ends by exploring the distinction between acute and chronic seed system stress, and the range of interventions which may be appropriate to each. This concluding section was specifically triggered by the case study’s substantive findings. When the consultancy was first commissioned, ‘the problem’ was presented as an acute one: Kenyan farmers had suffered from the effects of drought in the season prior to 1997 and needed seed to sow when rains next fell. However, as the work unfolded, using government documents and perspectives (top-down overviews) and drawing on valuable farmer insights (bottom up), it became clear that the drought situation was not a once-off affair. It was not a discrete, *acute* disaster situation. During the last decade, many Kenyan farmers had suffered the effects of droughts on a repeated basis and their seed system problems have developed as more *chronic* ones.

### **METHODOLOGY**

The heart of the report builds on extensive interviews with beneficiaries, and local aid implementers. Some 172 farmer interviews were conducted at four main sites where seed was distributed during 1997: Machakos, Baringo, Makueni, Embu/Mbeere. (A fifth site, Thika,

yielded a smaller number of ‘pre-test’ insights). Interviews elicited both in-depth qualitative reflections as well as quantitative assessments relating to such issues as seed sown and yields obtained. Farmer selection was done randomly: every 3<sup>rd</sup> to 5<sup>th</sup> house (depending on residential density) in zones of blanket distribution, or off recipient lists where there was more restricted distribution. Farmer testimonies were complemented by written project documentation and interviews among seed-aid managers and planners at various levels of field operation (eg the Government of Kenya, Ministry of Agriculture, Office of the President, Kenya Agricultural Research Institute (KARI), and non-governmental organization staff).

All sites were located in small farmer areas and characterized by low, sporadic rainfall (600-950 mm) and, at all, those implementing the aid (government, NGO and church staff) were keen for the self-reflection which case analysis might bring. The Government Ministry of Agriculture managed the seed aid in Machakos and Baringo, distributing maize and beans in both, and adding to the Baringo aid package some high quality vegetable seeds (onions, cabbage and tomatoes) as farmers targeted had access to irrigated plots. The other two sites were Church/NGO implemented. In Mbeere/Embu, the Diocese, with financial and some technical support from Catholic Relief Services (CRS), distributed seed aid of maize, beans as well as sorghum, millet and cowpeas. In Makueni, a prior development program started by German Agro Action-(GAA) in 1995, turned into an emergency operation. Since GAA’s overall aim was to maintain nutritional standards by diversifying crops and improving methods of local seed production, they gave an array of seed (beans, sorghum, millet, cowpea, pigeon pea, green gram) and trained communities in group organization and techniques of seed production.

## **FINDINGS**

### **The internal process and effects of seed aid**

An ‘internal’ type of analysis is the kind most often programmed as follow-up by key aid givers, i.e. governments (see, for example, Anon. 1997) or implementing NGOs (e.g., CRS/Kenya-DRI 1997). Taking place shortly after implementation (during the planting season or just after harvest), this ‘internal evaluation’ explores questions of crop and variety choice, logistical procedures (timing and methods of distribution), adequacy of amounts given, and beneficiary targeting. Internal evaluations may be used to improve the process of giving seed aid in future delivery periods, once the decision has been made to embark upon a seed-and-tools program.

Most farmers assessed the ‘product-associated variables’ quite favorably in the 1997 distribution. They deemed the type of crops and varieties (basically improved varieties of maize and beans) as appropriate, with the more drought-tolerant crops also deemed ‘acceptable’—as long as maize was one of the elements included in the aid package. Farmers also remarked on the high quality and germination properties of the seed. Simply, most have not used certified seed—or only when given it free. The case of the maize distribution is somewhat special, as it consisted primarily of hybrids (the 500 series and 600 series) with some delivery of the composite variety Katumani. Poorer Kenyan farmers do not routinely use maize hybrids (except in Baringo)<sup>ii</sup>, and they were impressed with its ‘specialness’ and even ‘luxury value’, but not necessarily just for direct sowing. Farmers can exchange the packaged maize for urgently needed items (e.g. food staples such as salt, sugar, and oil). Seed aid in this sense achieves a ‘currency’ function.

How did these farmers' subjective assessments of the appropriateness of seed 'product' inputs compare with their actual practices? According to farmer testimony, the great majority of the aid seed was sown—across crops and across locations. For instance, 85% of farmers sowed all (100%) of the maize seed received, while 72% of those receiving cowpea sowed all (100%). Further, 83% of those who received sorghum seed sowed at least half of that aid given. The relatively lower proportion of sorghum and cowpea sown reflects farmers' secondary preference for this crop, although by absolute standards, the percentages sown indicate positive interest.

It was in terms of all the 'process-associated variables'—all three—that farmers universally expressed strong discontent: the timing of distribution was late in relation to critical planting dates, the targeting not transparent, and quantities of seed received were just 'too little'. The less rigorous targeting was directly related to lesser quantities received per farmer. Overall, the process variables were rated higher at a single site where a prior assistance/development program had been established (the site of GAA).

While seed arriving late is a common complaint across seed-aid interventions, in Kenya 1997, the process was given an unusually late start due to the delay in announcing an official emergency, at the end of January 1997 (CRS-Kenya/DRI 1997). Funds for seed purchase and transport cannot be raised until an official emergency has been declared. Only GAA in Makueni, which had a prior seed-assistance program on site, was able to deliver most of their aid punctually.

Across sites, the farmers' biggest complaint about the maize received was the small quantity, with discontent highest at Machakos, where a generalized, untargeted, government distribution took place. There, a cluster of farmers received almost nothing (0.1, 0.2, 0.25 kg). There may be costs of targeting well (the technical costs of learning which farmers need seed, as well as the political and social costs of 'not giving to all') (see also Archibald and Richards, this volume). However, there are also substantial—and direct—costs to *not* targeting. Those most in need may receive only token help, and not enough to spur on their agricultural viability.

### **Internal process and effects: two burning issues**

#### Goals of seed aid

The goals of giving seed aid were neither similar—nor transparent--- among the four cases analyzed. This was evident on several levels. Project documents were generally vague about goals (with the exception of GAA's) -- stating simply that seed aid was being given to ensure that farmers had something to plant. Second, the government distributions used different design principles in the two sites examined (although public rhetoric is that all Kenyan citizens deserve the same—or 'equal'); Third, communities were unable to distinguish among the different agency rationale for aid gifts, with some households having received two or three seed packages the same season—but from different sources.

Based on analysis of practice, there seem to have been at least four different goals. Seed was given:

-- *to fill a temporary seed gap—for the farmer to have something to plant*

This was most evident in the Embu/Mbeere case, where a variety of crops were given (including some of the more drought-tolerant) and where those receiving aid were generally among the poorer farmers (i.e. receiving aid from the church).

- *to encourage self-help, or for farmers to achieve a self-sustaining seed-production strategy*  
This was clearest in the Makeni case, where farmers received training in improved seed-production techniques, were organized into collaborative groups, and were also encouraged to put more emphasis on drought-tolerant crops.
- *to give a gift to constituency—political combined with farming goals*  
Machakos is the type case here. Farmers' standard crops—maize and beans—were given as seed to all who turned up, although the certified maize seed was an extra bonus for many. Complete lack of targeting resulted in relatively small quantities of seed received per person (but encouraged broad support for ruling government party—who organized the aid)
- *to stimulate 'progressive' modern farming practices*  
The Baringo seed distribution illustrates this goal. Progressive farmers—those with precious irrigated plots-- were targeted with hybrid maize and income-generating vegetable seeds.

None of these goals is inherently negative, although the first two probably more closely parallel the goals aspired to emergency stress situations. However, the multitude of goals, and accompanying approaches, created confusion among the general population about what seed aid is for, and perhaps created false expectations as well as unnecessary, *even routine, dependencies*—as exemplified in the following farmer statements.

Embu: “Seed relief aid should be given throughout the year [i.e., every season], whether during emergency periods or normal periods, because there are some farmers who have enough land but can't make use of it because of financial problems. The most serious problem is the high price of seeds [an access problem].” [interview No. 4]

“It is very difficult to get seeds from the local market or any other place because of the prices—so seed relief should be encouraged more.” [interview No. 7]

Minimally, the goals of a seed-aid operation should be clear to all (donor, implementer, farmer) and should be matched with an active strategy to reach those goals. In the current Kenyan situation, we seem to have hidden goals and multiple (even conflicting) expectations.

### Targeting

A confusion of goals necessarily translates into a muddled targeting situation, although it is difficult to say which factor precedes the other. Without a definition of goals beforehand, it is hard to judge the effectiveness of subsequent targeting.

Among the four sites visited, several targeting strategies were noted (Table 1). Programs such as the Ministry of Agriculture's (MOA) distribution in Machakos achieved zonal targeting: i.e., everyone in the zone received aid (known as 'blanket distribution' or 'equi-distribution'). In the other areas, attempts were made to target specific groups within zones. This encompassed the more vulnerable in both the Church/CRS-sponsored distribution of Embu/Mbeere and the GAA-sponsored seed program in Makeni, while the MOA-sponsored program of Baringo seemed to

target the more progressive farmers (those with ‘exemplary farming practices’). The Church sample had the additional targeting criteria of reaching Catholics. This may have been an outcome rather than an explicit strategy, as prayer houses proved to be the major channels of dissemination.

**Table 1: Farmer-perceived criteria for those who received seed aid in 1997—  
*distinctive features***

Makueni	Embu/Mbeere	Machakos	Baringo
* Seed for Work	* Only Catholics	* all who went to chief's <i>baraza</i> [meeting]/all who turned up/all who went to agricultural extension meeting	* Farmers who adopted techniques of extension staff
* Groups trained and given seed (self-help)	* Anyone who presented himself/ herself at Church	* All were given	* Extension agents chose
* Those belonging to organized farmer groups/ women's groups	* Small fee charged per kilo. Then those who went to church and paid—received	* Farmers ready to plant—because seed came late	*Best farmers: “If she prepared her farm well, she got more”
	* List written down. It included Catholics and non-Catholics		
	*Through Church Committee		

What is clear within the Kenyan context is that lack of transparent and well-articulated goals on the part of the donor and project managers is creating significant friction among those who dispense the seed and among many of the recipients. There were repeated accounts of the some of the poorest farmers receiving insignificant amounts. Furthermore, an overwhelming majority (95% of those interviewed) indicated that the seed aid was simply “too little.” This statement could also be interpreted as a sign of the increasing dependency and expectations of farmers on outside, ‘free’ support.

The targeting scenario posed in this Kenya study should be one of the easier ones as populations are physically stable (compared to refugees on the move) and have lived in their home areas for at least several seasons (so have some idea of each others’ relative wealth levels). Some further parameters would need to be addressed to get more focused delivery: how to define seed-vulnerable populations in an emergency situation (i.e. those who neither have seed nor the means to access it), and then how to distinguish those who are experiencing *acute* seed stress (that is, stress just this season, due to e.g. drought) from those who are chronically seed insecure (and require outside help nearly every season).

However, many of the challenges in remedying targeting concerns are political and/or social. In general public distribution places (such as government-called community meetings), populations have been given the sense that seed aid is their right as Kenyan citizens and that all should benefit from government gifts.

### External process and effects of seed aid:

An ‘external’ assessment looks at the effectiveness of aid delivered in the context of farmers’ broader agricultural-management strategies. It examines whether the seed aid given helped farmers “get back on their feet”. To arrive at this longer-term perspective, farmers’ history of seed aid has been briefly reviewed and its relative importance among farmers’ other seed-procurement strategies is assessed during emergency and more normal agricultural periods.

Between 1992 and 1997, on average, each family interviewed had received seed aid twice, with a high of 10 times. (Table 2) Most farmers, irrespective of wealth, had received seed aid more than once in the last decade. Those in the ‘church sample’ (Embu/Mbeere), who correlated more with poorer segments, received seed aid once in about every two to three seasons. Farmer comments suggest that many have come to expect ‘emergency’ aid on a continued basis.

**Table 2: Number of times Kenyan farmers have received seed aid 1992-1997**

Region	Average	Mode	Maximum	Minimum
Machakos (N=46)	1.8	2	4	0
Baringo (N=46)	1.4	1	3	0
Makueni (N=33)	2.2	1	5	1
Embu/Mbeere (N=40)	3.1	4 / 3	10	1
Thika (N=7)	3	3	5	2
OVERALL (N=172)	2.1	2 / 1	10	0

For the specific season of Long Rains 1997, seed aid of maize, which was the lion’s share of aid given, provided 14% of the total quantity of maize sown, while for beans, seed aid represented 11% of the total seed sown. The situation for sorghum and cowpea was slightly different because aid agencies most often gave these crops expressly to diversify farmers’ crop profiles in more drought-prone areas (That is, farmers did not routinely sow such ‘novel’ crops). Seed aid for these minority crops accounted for 33% and 27% of the total seed sown for sorghum and cowpea, respectively. Thus, during the emergency period, farmers accessed the majority of their seed for all four crops analyzed (maize, beans, sorghum, and cowpeas) by themselves. Across crops, a large portion of seed was sourced from local markets (not stockists specializing in certified seed).

In terms of the emergency phase, a question key to aid agency's heart was posed : How many farmers relied on seed aid for 100% of the seed sown of a particular crop? That is, would there have been farmers with no seed at all of the particular 'aid' crop—in the absence of outside intervention? Overall figures varied from 14% to 67% of farmers at each site. However, a closer analysis, by crop, showed that only ten farmers relied 100% on seed aid for their key crops—that is, those crops in which they themselves normally invest. (Table 3). For most farmers, seed aid supplied their full seed stock only if the crop were relatively new or of lower priority (as in the case of cowpea, sorghum, pigeon pea, or millet), or in the case of income-generating vegetables such as onion, kale, and tomato. That is, during the emergency distribution, the large majority of farmers found ways to get at least some seed on their own.

**Table 3: Farmers who relied on seed aid for 100% of the seed sown of a given crop, Long Rains 1997**

SITE	MAKUENI (N=30)	EMBU/MBEERE (N=33)	MACHAKO S (N=35)	BARINGO (N=28)
Staple crops	3%	21%	0%	7%
<i>Versus</i>				
More novel crops	63% millet cowpea sorghum	36% millet cowpea sorghum	14% sorghum	21% income- generating vegetables
OVERALL: 8% for staple crops; 33% for novel crops				

Farmers' normal crop and seed-procurement strategies were also a subject of inquiry---- to determine how 'abnormal' the practices were (or not) during the designated emergency. Farmers can normally use some seven potential channels for accessing seed.<sup>iii</sup> For maize, nearly all farmers regularly use home-saved maize seed as their main source, topping off seed stocks through purchase at local markets. Use of stockist seed, that is, use of improved varieties and certified seed, is key only in the Baringo sample, although between one-quarter and a third of farmers in Machakos and Embu/Mbeere claim to use it 'occasionally.' Certified seed and hybrids are rarely used in Makueni. This overwhelming dependence on local maize seed perseveres in a context of vigorous and prolonged government efforts to promote hybrid and certified material.

For beans, across sites, farmers use home-saved stocks as their central source for seed. However, local markets appear as an equally important source (Table 4). Given that bean seed can easily be selected out from the previous harvest (i.e., as it is self-pollinated), it is surprising how many farmers get bean seed off-farm every season or every other season (about 30% across the sites), with high amounts being acquired in this way (70% or more of stocks). Most farmers get more than half their bean seed off-farm on a regular basis.



**Table 4. Beans—farmers’ normal procurement sources for seed  
(% farmers citing source)\***

Source	Makueni (N=20)	Embu/Mbeere (N=20)	Machakos (N=35)	Baringo (N=22)
Home saved	100	94	77	91
Local market	95	83	97	86
Stockist	–	6	6	14
Relatives	10	22	9	5 (neighbors)
Other			Extension: 6 Food Aid: 6	

\* Note that farmers regularly access seed from several different sources during the same season

For both maize and beans, the Kenyan data run counter to what is often taken as a truism when describing farmer seed systems: that is, that about 80% of the seed used by ‘normal farmers’ comes from their own stocks and, hence, that accessing off-farm seed sources is ‘abnormal.’ (e.g., Cooper, 1993) The Kenyan material shows that small farmers *routinely* rely on local markets for a significant portion of their seed.

Farmers overwhelmingly expressed dissatisfaction with their maize-procurement strategy, with the notable exception of Baringo where the ‘progressive’ sample accesses seed from stockists. The large majority can’t afford certified seed (and find the prices exorbitant) and complain about the local market: the right varieties are not available, the seed is poor quality, merchants cheat on quantity, and the distances are too great. This widespread dissatisfaction seems relatively serious for a crop that forms the core of Kenyan agriculture.

For bean-seed acquisition, farmer sentiment is also strong and clear across sites. The large majority find themselves heavily tied to the local market—spending money but not sure of the quality they are receiving. Because beans are self-pollinated, farmers generally regard bean seed as something they should not have to buy, sparing the money instead for school, medicine, and food. Overall, what does the ‘average’ farmer want in terms of bean seed? Self-sufficiency. She wants to save seed money, to save transport getting seed, and she wants the seed on time—all implying that home-saved seed is the way to go.

Have seed (and seed-related) trends improved for maize and beans over the last decade? From the farmer perspective, apparently not. Prices have gone up, exchange networks have become weaker, and deteriorating soil fertility and fragmentation have meant smaller harvests. The few positive developments—some new varieties, the emergence of seed aid, the packaging of varieties in smaller, more affordable, packets—do little to counteract strong negative forces.

In sum, in terms of an ‘external analysis’ there is no concrete evidence that seed aid, *per se*, has been strengthening farmer systems. Those who have received it once are not necessarily less likely to receive it again, and the amounts given have not been significant in the context of farmers’ overall seed-procurement strategies. Further, the main crop given—hybrid maize—does not ensure that farmers can become less dependent on outside sources: it only performs in better, more fertile conditions, and has a built-in deterioration factor (that is, gradually loses its hybrid

vigor, if seed is not renewed).. Considering that it only treats a symptom, and perhaps not in the most effective way, seed aid, as currently delivered, seems to be a rather costly intervention.

## **WIDER REFLECTIONS: DIAGNOSIS OF SEED SYSTEM CONSTRAINTS AND OPPORTUNITIES**

When this case analysis was first commissioned, ‘the problem’ was presented as an acute one: Kenyan farmers had suffered from the effects of drought in the season prior to 1997 and needed critical seed to sow when rains next fell. The consultancy was to evaluate the effectiveness of the seed-delivery program; that is, the internal process and products: were the right varieties given, were they given on time, and were they given in an equitable manner.

However, as the work unfolded, it became clear that the drought situation was not a once-off affair and was not a discrete, *acute* disaster situation. For some Kenyan farmers, the last decade has been one in which they have suffered droughts on a repeated basis. Between distinct and severe dry periods, their farming systems have been stable. Yet with sharp drops in rainfall, like those in 1991–92 and in 1996, they have required help from the outside—to get back to where they were. These farmers have been experiencing *repeated acute stress*.

For many Kenyan farmers within the sample, however, the seed stresses they describe are neither acute nor repeated acute—they are there on a continual basis. Small plots (and harvests), unreliable rainfall, lack of adapted varieties, poorly adapted crops (like maize in many areas), distant markets, scarcity of cash to purchase seed—all hinder their being able to produce and/or access sufficient quantities of seed each season. While seed-and-tools treat their problems as acute, indeed their stress situation is a *chronic* one.

The final section of this article explores further the conceptual distinctions between acute and chronic seed insecure situations. Building on the Seed Security Framework presented elsewhere in this volume (Remington et al, this volume), the piece concludes by distinguishing among the varied types of interventions to be contemplated in different seed insecure contexts. The distinction between acute and chronic is first briefly explored below. It is then tied to the seed security framework elements of: seed access, seed availability, and utilization concerns.

### **Acute versus Chronic Seed Insecurity**

Acute seed insecurity is brought on *by distinct, short duration events* that often affect a broad range of the population. It may be caused by the failure to plant a single season, loss of a harvest, or one-time loss of seed stocks in storage. While in ‘normal times’ we may find the seed secure, the semi secure, and the ‘always seed short’ households (i.e. chronically seed insecure), all may be affected during an acute event such as flood or short civil disturbance. Those communities and farmers who recover quickly, with or without one-off seeds-and-tools assistance, often are those who suffered only from acute stress.

Chronic seed insecurity is independent of an acute stress or disaster, although it may be exacerbated by it. Chronic seed insecurity may be found among populations that have been marginalized in different ways:

- Economically/socially marginal (poor, little land, little labor)
- Ecologically marginal (e.g.. repeated drought, degraded land)

- Politically marginal (insecure areas, or on land with uncertain tenure arrangements)

Chronically seed insecure populations may be characterized by: (1) continual shortage of adequate seed to plant than needed; 2) Difficulties in acquiring off-farm seed due to poverty (3) the utilization of low quality seed and unwanted varieties on a routine basis. The result is households with a built-in vulnerability to seed system calamities.

Acute and chronic seed insecurity are closely linked. More and more, we see a transition from acute to chronic seed insecurity rather than recovery as various forms of ‘quick relief’ (eg free distribution of improved varieties) serve to undermine the function of local seed systems and alter more robust crop profiles (Sperling, 2000). Relief interventions must both look for ways to increase seed security in chronically vulnerable areas and to assist communities to recover from acute disasters to prevent this slide into chronic seed insecurity.

### **Seed Security Framework : Building in Acute versus Chronic distinctions**

The Seed Security framework (Remington, et al, this volume) distinguishes among the different types of constraints embodied in the concept of seed insecurity. There may be concerns of availability, farmers’ access to seed overall seed availability, or actual seed utilization (that is, the genetic or seed quality appropriateness). In the section below, we add still another layer to this framework reflecting on such constraints in the context of acute seed insecurity situations versus chronic seed insecurity situations.

Each of the three boxes below reflects on a different constraint (e.g. seed access) in an acute versus chronic seed insecurity situation, and the type of intervention which might be appropriate to lessen the stress. The purpose of the framework and the boxes is to link problem diagnosis with focused action.

#### **Box 1: Problem: Access to Seed**

<b>Acute Stress</b>	<b>Chronic Stress</b>
<p>Farmers lack access to seed due such factors as low purchasing power because of loss of assets; erosion of social networks due to displacement; breakdown of trust (in conflict situations) reluctance of neighbours to help each other; or an uncertain future (in conflict situations) preventing seed loans. Desired seed is available locally, but they have no means to buy it or otherwise traditionally access it.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Vouchers which supports rather than undermine the local seed market and enable farmers to access current varieties.</li> <li>2. Cash grants.</li> <li>3. Focused effort to design interventions to avoid further damage to social relations: including careful design of targeting strategies and distribution systems to take account of social changes.</li> </ol>	<p>Farmers lack of access to seed due such factors as poverty and its associated low purchasing power and smaller, more constricted social networks (which routinely do not share). Desired seed is available locally, but they have no means to buy it or otherwise traditionally access it.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Income generation activities both on farm with cash crops and dual purpose crops or off-farm employment.</li> <li>2. Cash for work.</li> <li>3. Extensive community and local-level network building work.</li> </ol>

**Box 2: Problem: Seed Availability**

<b>Acute Stress</b>	<b>Chronic Stress</b>
<p>Farmers lack seed because of an absolute lack of seed in an area to meet minimal needs, due, for example, damage to crops prior to harvest (eg by natural disaster), theft or unusual damage to household seed stocks. This absolute lack is often associated with a spatial unavailability. Seed may be available regionally, but it cannot be transported because of transportation system breakdown, marked insecurity, or a natural disaster. It can also be related to temporal unavailability where there is a sudden and dramatic increase in demand, especially for alternative crops or shorter duration varieties immediately after the disaster.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Importation of seed in large quantities to be sold unless purchasing power has also been identified as constraint.</li> <li>2. Importation of seed of acceptable varieties or crops and delivery to farmers in a timely fashion using alternative forms of transport.</li> <li>3. Seed fairs with cash sales/vouchers and seed company or trader input.</li> </ol>	<p>Farmers lack seed to meet minimal needs due to such factors as small farm size, or low output (caused by labor shortage, pest/diseases, lack of inputs). This absolute lack is usually due to spatial unavailability. Seed may be available in the region, but non-functioning transportation systems or weak market infrastructure more generally (e.g. traders' access to credit, sufficient storage facilities, pricing policies, etc. etc). can create continual shortages. .</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Development or enhancement of local seed production from small scale or micro enterprises built on existing local producers or newly-developed groups. The cost structure has to be kept only marginally above seed for grain while maintaining quality and variety integrity at levels 'at least' as good as what farmers regularly use. Production should focus on farmers' or improved varieties or crops that are in demand by immediate producers and consumers.</li> <li>2. Transport and sale of seed via diversified routes and multiple distribution points. Best to build on existing channels to keep cost low but this will not necessarily use the existing seed channels per se. Compare cost effectiveness of diverse channels, for example: merchants, nutritional centers, schools, Coca Cola trucks. It may be better to use routine conduits but expand their range of goods. Also test which outlets reach which types of farmers/consumers, wealth classes, and ethnic groups.</li> <li>3. Enhancement of decentralized information channels since the absence of a market information system may not allow prospective seed suppliers to respond to demand.</li> </ol>

**Box 3: Problem: Seed Utilization Concerns**

<b>Acute Stress</b>	<b>Chronic Stress</b>
<p><i>Variety Adaptability</i></p> <p>Farmers lack adapted crops/varieties because sudden environmental stress: eg: drought/flood,</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Seed ‘aid’ with a strong emphasize on the kind of crop and variety to be delivered. The crop or variety must be selected specifically to counteract ‘emerging’ stress.</li> <li>2. Seed fairs with cash sales/vouchers and seed company or trader input which help circulate adapted varieties and seed.</li> </ol> <p><i>Seed Health and Physiological Quality</i></p> <p>Farmers seed, or seed available from market or others, is (unusually) of poor quality based –due to, for example, sudden/short-lived disease/pest occurrence.</p> <p>Possible Interventions:</p> <ol style="list-style-type: none"> <li>1. Seed treatments of farmers’ or local market seed</li> <li>2. Import of healthy seed or treated seed</li> </ol> <p><i>Variety Integrity</i></p> <p>Farmers varieties’ with appropriate purity and adaptation are not available/ accessible in the short term. Alternatively, improved varieties or alternative crops are not available/accessible to farmers so as to maintain adequate levels of diversity and adaptation.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Vouchers or seed fairs with access to appropriate farmer and/or improved varieties or crops</li> <li>2. Other delivery systems which make available/accessible appropriate farmer or improved varieties. (These might even be given in standard seed aid package)</li> </ol>	<p><i>Variety Adaptability</i></p> <p>Farmers lack adapted crops/varieties which allow them to respond to longer-term changes in the cropping system. These may have become necessary because of: environment shifts(like warming), rise of disease and pest incidence, inappropriate promotion of unadapted modern varieties (MVs), or routine lack of access to inputs such as labor, cash, fertilizers, or pesticides.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Promotion of crops/varieties tolerant to the biotic and abiotic stress. This is often associated to shifts to early maturity variety or crops.</li> <li>2. Production of alternative crops, such as legumes that are less labor intensive or need fewer inputs. A range of varieties should be promoted that will increase farmers options for adoption.</li> <li>3. Participatory plant breeding work which encourages farmers and formal breeders to work jointly to identify/develop adapted and acceptable varieties</li> </ol> <p><i>Seed Health and Physiological Quality</i></p> <p>Farmers seed, or seed available from market or others, routinely is of poor quality (as assessed by farmers) or lacks vigor needed for farmer-acceptable germination and establishment.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Reduction of post-harvest seed storage loss or deterioration with granaries or other forms of improved storage.</li> <li>2. Routine use of low cost seed dressings</li> <li>3. Analysis of existing seed handling and storage system with farmers to identify constraints to investigate alternative approaches</li> <li>4. Farmer (and possibly seed/grain trader) training on seed storage options and better handling of seed.</li> </ol> <p><i>Variety Integrity</i></p> <p>Farmers’ varieties, improved varieties or alternative crops with appropriate purity and adaptation are not available. Farmers cannot maintain adequate levels of diversity and adaptation in own saved seed or that from the market.</p> <p>Possible interventions:</p> <ol style="list-style-type: none"> <li>1. Seed Fairs held routinely ( to promote distribution of both local and adapted improved varieties).</li> <li>2. Participatory testing of a range of cropsvarieties.</li> <li>3. Participatory plant breeding work which encourages farmers and formal breeders to work jointly to identify/develop adapted and acceptable varieties</li> </ol>

In conclusion, the aim of these frameworks is to develop a focused strategy for addressing the continuum of acute and chronic seed insecurity constraints plaguing small farmers in many regions of the world. In light of this range of constraints, giving 'seed aid', again and again, seems to be a relatively blunt response to what is indeed a more complex, but identifiable set of problems. Tailoring an aid support response to specific seed system constraints should lead to shorter and longer-term beneficiary gains and subsequently, also, to significantly higher intervention cost-effectiveness-- for all concerned.

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## End notes

<sup>i</sup> The Kenyan case study, which forms the body of this article, draws from 90-page report with the following reference : L. Sperling. Emergency Seed Aid in Kenya: A Case Study of Lessons Learned. (August 2000) completed under a United States Agency for International Development contract (#LAG-4111-00-3042-00).

<sup>ii</sup> For many farmers, certified seed is just too expensive. In addition, maize hybrids, that is, the genetic material, may not be adapted to their poorer soils and/or may require fertilizer inputs they simply cannot afford.

<sup>iii</sup> Seed might be obtained from the following sources:

seed aid	given in emergency aid (from church, NGO or government)
home-saved	saved from the previous harvest and stored within the homestead
local market	bought from open markets or local shops that stock grain and seed (often a mix of both). Genetically, this may include local varieties and improved varieties that are circulated through markets (such as self-pollinated beans, OPV maize)
stockist	procured from specialized input-supply shops that carry certified seed, fertilizers, pesticides, etc.
extensionist	supplied by government agent who normally promotes varieties coming from research and/or private sector
relatives	given (usually as gifts) by close relatives
other	a mixed bag of anything else that happens on an irregular basis: e.g., picked from abandoned field