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**EMERGENCY SEED AID IN KENYA:
A CASE STUDY OF LESSONS LEARNED**

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PREFACE

This report reviews the effectiveness of seed aid in Kenya, with emphasis on the process and products of aid delivered during the Long Rains 1997 (February to June). While focusing on a single season just after a drought, it draws on a history of almost 10 years of repeated seed aid, with yet another intervention being organized as this report is being written. From an 'internal' organizational perspective, the report explores how the seed aid was managed at the community level and then puts this in the view of an 'external' perspective that examines the effects of seed aid interventions on the longer-term sustainability of Kenyan farming systems. One of the unique features of this report is its inclusion of a strong component of smallholder farmers' own assessments and reflections on the effectiveness of the seed-aid intervention.

A workshop on seed-system analysis was also funded under this grant—drawing from the Kenya findings but also on a range of seed interventions in East and Central Africa (Somalia, Sudan, Uganda, Rwanda) and select sites beyond (e.g., Honduras and the 'Mitch'-related emergency assistance). This workshop, held June 21-24, 2000, in Kampala, Uganda, sought to accomplish the following:

1. Exchange and synthesize 'better practices' among seed-system interventions in East and Central Africa;
2. Develop/refine conceptual tools for more informed design of seed-system interventions.

The proceedings of the Uganda workshop are published as "Targeted seed aid and seed-system interventions - strengthening small-farmer seed systems in East and Central Africa".

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L.M. M'Ragwa, Foundation Seed Manager at Kenya Agricultural Research Institute (KARI) Headquarters, generously hosted the study—partly to emphasize how central research and development (R&D) has to be to seed relief and rehabilitation situations. CIAT scientists, Roger Kirkby and Sonia David offered important insights into seed issues beyond Kenya, and from the CIAT office in Uganda, Julius Kamulindwa provided critical logistical support. Kande Matungulu, first with CIAT and later with CRS, spearheaded the difficult task of moving interviewers among farms and field sites.

We are grateful to the United States Agency for International Development (USAID) for the financial support provided for this study under Grant No. LAG-4111-00-3042-00. This report would not have emerged at all without the interest and encouragement of Carole Levin, G/EG/AFS, USAID, and Ray Meyer, of the Office of Foreign Disaster Assistance, USAID, in upgrading the quality of 'emergency aid' and in linking emergency to recovery from the very first stages of agricultural intervention. In this vein, thanks also to Tom Remington, who at all stages has been an excellent intellectual sparring partner.

LIST OF ACRONYMS USED

CIAT	Centro Internacional de Agricultural Tropical (International Center for Tropical Agriculture)
CRS	Catholic Relief Services
EDRP	Emergency Drought Recovery Programme
GAA	German Agro-Action
GOK	Government of Kenya
KARI	Kenya Agricultural Research Institute
KSC	Kenya Seed Company
MOA	Ministry of Agriculture
NARS	national agricultural research system(s)
NGO	nongovernmental organization
OP	Office of the President
OPV	open-pollinated variety
USAID	United States Agency for International Development

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Executive Summary

I. Context

1. This report reviews the effectiveness of seed aid in Kenya, with emphasis on the process and products of aid delivered during the Long Rains 1997 (February to June). While focusing on a single season just after a drought, it draws on a history of almost 10 years of repeated seed aid, with yet another intervention being organized as this report is being written. One of the unique features of this report is its inclusion of a strong component of smallholder farmers' own assessments and reflections on the effectiveness of the seed-aid intervention.
2. Seed aid, as distinct from food aid, is a relatively new phenomenon in the Horn of Africa (dating within the last decade) and both seed aid and seed-system support have yet to be seen as something fundamentally different from food aid and food-assistance support.

Seed aid is different from food aid in at least three key aspects:

- Seed is not intrinsically useful. It has to be adapted to the immediate biophysical environment, and adapted to farmers' potential management levels. It also has a built-in, often narrow, time limit for usefulness.
 - Seed interventions affect the heart of a farmer's agricultural system—such as farmers' programming (of land, labor, intercropping patterns)—and tie it into a routine that assumes a certain stability. Further, although seed is often given under the rubric of short-term intervention (the 'Seed and Tools' paradigm), its effects on the agricultural system can be long-term.
 - Seed is costlier than food for all key actors (farmers, implementers, donors).
3. In Kenya, seed aid has been delivered on a fairly large scale—about every other season since 1992—and across a large number of districts. The focus has been heavily on maize over the years and throughout the regions.
 4. The case study draws from research at four sites where seed aid distribution has taken place (Machakos, Baringo, Makueni, Embu/Mbeere). These sites were chosen so as to compare and contrast aid delivery by a variety of organizations, both government and nongovernment (NGOs), with slightly different approaches to seed-system support in similar agroecological contexts.

The study examines both the internal process and effects of seed aid delivered during the Long Rains 1997 (February to June), along with the external process and effects:

- *Internal process and effects* refers to issues such as the appropriateness of the crops and varieties distributed and the targeting of seed-aid recipients.
- *External process and effects* examines how the seed-aid intervention affected farmers' broader agricultural management strategies and whether the seed helped farmers get back on their feet and establish a sustainable means of accessing desired seeds.

II. The internal process and effects of seed

1. Most farmers interviewed received seed aid in 1997 (77.8%) with the sites managed by the Government of Kenya (GOK) generally giving maize and beans (plus vegetable seeds in Baringo), and the NGO-managed sites distributing some maize and beans *plus* a range of more drought-tolerant crops (cowpea,

sorghum, millet, pigeon pea). One site also programmed in a component of farmer capacity building (in improved seed production).

2. Farmers generally assessed the crops and varieties given as appropriate. The more drought-tolerant crops were also deemed 'acceptable'—as long as maize was one of the elements in the aid package. Furthermore, farmers commented on the high quality of the seed; most of the farmers sampled did not routinely use certified seed or maize hybrids (except in Baringo). They recognized the 'luxury value' of hybrids, but not necessarily just for direct sowing. Farmers can exchange the packaged maize for urgently needed items (for example, food staples such as salt, sugar, and oil). Seed aid in this sense achieves a 'currency' function. Thus, the 'products' delivered received high ratings.
3. Farmers expressed strong discontent with all three 'process' variables—that is, the timing (generally late), targeting (not transparent), and quantities of seed received (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.
4. Each of the four sites had specific built-in biases in targeting, with the possible exception of a government-managed site (Machakos) where there was a blanket distribution for all appearing at public meetings. Apparent biases included those who organized into work groups (Makueni), Catholics (Embu/Mbeere), and those with access to irrigated plots (Baringo). There was some evidence that poorer populations were also specifically reached in the Embu/Mbeere sample.
5. Lack of targeting transparency is creating social frictions. Farmers cited 27 different (sometimes conflicting) criteria used to select recipients. At GOK-managed sites, all expect seed as part of a 'public good' and 'their right.' The fuzziness in targeting also reflects an ambiguity in the goals set for the seed-aid distribution (see point II. 7, below).
6. While vouchers were not given, exploration of their potential acceptability showed farmers very divided as to their usefulness and acceptability. Much depends on (a) the availability of local crops/varieties, even if purchasing power is guaranteed, and (b) the will power of farmers to use the cash/voucher solely for seed stocks.

Different kinds of farmers seem to prefer different options, based to a certain extent on wealth. The very poorest prefer seed aid because of their fear of diverting money and because the maize hybrid is beyond their normal reach. Richer farmers—a good number of whom received seed aid—generally feel equally disposed to the two options because hybrids are what they normally use and they have little trouble reaching the seed stocks. The issue of distance to market cross-cuts wealth categories, as does a concern that 'quality' seed (local quality seed as well as certified) just isn't available in local markets. In areas where aid organizations are experimenting with non-maize options, farmers sometimes prefer the seed aid just because the crops or varieties they desire (green grams, cowpeas, millets) may not be easily accessed otherwise.

7. Most fundamentally, the internal analysis showed that the goals of giving seed aid were not very transparent in the four cases analyzed. Based on an analysis of practice, there were at least four different goals:

- *to fill a temporary seed gap—for the farmer to have something to plant*
- *to encourage self-help, or for farmers to achieve a self-sustaining seed-production strategy*
- *to give a gift to a political constituency—political combined with farming goals*
- *to stimulate 'progressive' modern farming practices.*

None of these goals is inherently negative, although the first two probably more closely parallel goals aspired to in emergency stress situations. However, the multitude of goals, and accompanying approaches, create confusion about what the seed is for and create false expectations as well as unnecessary dependencies.

8. Even the small number of cases suggests that seed aid (procurement and delivery) is more effective when decentralized:
 - The choice of crops and varieties can be more local and tailored to the environment.
 - Targeting on a smaller scale is more accurate
 - A range of approaches is possible, rather than standardized ones. In some cases, seed alone may be needed; in others, skill building may prove crucial, and in still others, novel approaches in crops and crop management may be vital.

III. External logic of seed aid: Has it served to strengthen farmers' seed and agricultural systems?

1. Since 1992, on average, each farming family has received seed aid twice, with a high of 10 times. Thus, most farmers, irrespective of wealth, have 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 seasons. Farmer comments suggest that many have come to expect 'emergency' aid on a continued basis.
2. Seed aid of maize, which was the lion's share of aid given, provided 14% of the total maize sown in the Long Rains 1997, while for beans, aid seed represented 11% of the total 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. Aid seed 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), even in ecologically stressed areas.
3. The research assessed the portion of farmers relying on seed aid for 100% of their seed sown during the Long Rains 1997. Overall figures varied from 14% to 66% of farmers at each site. However, a closer analysis, by crop, shows that only six farmers (out of 171 total across sites) relied 100% on seed aid for their key crops—that is, those crops in which they themselves normally invested. For most farmers, seed aid supplied their full seed stocks for a single crop 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.
4. Across sites, farmers primarily assessed their top two priority crops as maize and beans, with some of the more drought-tolerant crops cited in their place at unirrigated sites and the income-generating vegetables cited where the supply of water was more reliable. The matching of farmers' priorities with what they received as aid showed that, overwhelmingly, farmers received at least one of the crops they consider 'most' important.
5. Farmers can 'normally' use some seven potential channels for accessing seed. For maize, nearly all farmers regularly use home-saved maize seed as their main source and, also, regularly use the local market to top off supplies. 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 very vigorous and prolonged government efforts to promote hybrid and certified material.

6. For beans, across sites, farmers use home-saved stocks as their central source for seed. However, local markets appear as an equally used source. 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% plus of stocks). Thus, most farmers get more than half their bean seed off-farm on a regular basis.
7. 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 that accessing off-farm seed sources is 'abnormal.' The Kenyan material shows that small farmers routinely rely on local markets for a significant portion of their seed.
8. 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 their agriculture.
9. 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 shouldn't have to buy, using 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.
10. Have seed trends improved for maize and beans over the last decade? Apparently not—just the opposite. 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 packets—do little to counteract very strong negative forces.
11. There is no concrete evidence that seed aid, *per se*, is strengthening farmer systems. Those who have received it once are not necessarily less likely to receive it again, and the amounts given were not 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 conditions and has a built-in deterioration factor. Considering that it only treats a symptom, and perhaps not in the most effective way, seed aid (Seed-and-Tools), as currently delivered, seems to be a rather costly intervention.

IV. Characterizing seed system constraints and opportunities: The Kenya case

1. The external analysis of the farmers' seed situation in Kenya raises a number of fundamental questions about the type of problem seed aid is and was supposed to alleviate. Seed-and-Tools programs—that is, the delivering of quantities of seed and basic tools on a one-off basis (the kind of intervention being practiced in Kenya)—are designed to help farmers out of a temporary, and well-defined, *acute* situation. Seed and tools are given in a context where a series of assumptions are made, whether they are consciously articulated or not:
 - that farming systems have suffered an acute jolt and farmers have lost vital seed
 - that given a discrete injection of seed—a boost—farmers will have the means to plant the seed

given: that labor and inputs are adequate to plant and harvest, and that the situation is sufficiently secure

- that the seed given, once, will help farmers re-establish an independent means of producing and accessing their own seed.

2. The external perspective on seed aid has documented the general vulnerability of farmers' seed systems and overall agricultural systems. For some Kenyan farmers, the last decade has been one in which they have suffered droughts on a repeated basis. Between distinct, severe dry periods, their farming systems have operated well. However, with sharp drops in rainfall, like that 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*.
3. For many Kenyan farmers within the sample, the seed stresses they describe are neither acute nor repeatedly 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 of these things hinder the farmers' ability 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.
4. A framework is started within this report for examining *acute*, *repeated acute*, and *chronic* stresses, cross-cutting these seed-system disaster types with root causes: agroecological and political/economic, as well as seed-system issues themselves. In plotting material relating to seed-system functioning from the Kenyan case, economic and political constraints leap forward as a major farmer-articulated constraint. Further, the analysis shows that focusing on seed and variety issues, *per se*, is not effective for dealing with the real bottlenecks in many seed-system situations.
5. The issue of 'right seed/crop' is examined in the context of emergency versus nonemergency situations. At a minimum, crops/varieties for emergency interventions need to be
 - adapted to farmers' biophysical environment
 - adapted to farmers' preferences
 - adapted to farmers' management conditions
 - promoting risk aversion.

'Right variety/crop' is also examined on the basis of acute, repeated acute, and chronic seed-system stresses.

6. Hybrid maize proves to be a poor choice in the context of acute, repeated acute, and chronic stress situations. Most farmers do not routinely access hybrid maize seed from the stockist and therefore probably do not have the management expertise with which to nurture the 'aid' varieties. Moreover, most maize hybrids have not traditionally been designed for suboptimal environments and the built-in genetic deterioration of hybrids doesn't necessarily promote self-reliance for those farmers who cannot afford to renew their stocks annually. Simply, the overriding bias on hybrids—across years and regions—makes the situation something of an extreme or classic case of ignoring a basic emergency principle of promoting risk aversion.
7. A range of seed-system support interventions in East Africa—which go beyond seed-and-tools—is reviewed. These interventions have various goals, such as delivering more locally adapted varieties, ensuring that even the poorest farmers can get new materials, improving the quality of farmers' seed, and even helping farmers earn money from seed-production operations. They illustrate that a body of work is emerging to help address some of the more chronic constraints to seed-system health.

8. A paramount challenge to strengthening the systems by which farmers access seed rests in a more refined diagnosis of where the constraints and opportunities lie. Analysis of seed systems—farmer, formal, and those that aim to integrate the two—is a relatively new field. Prior to a decade ago, development work focused almost exclusively on supporting the institutionalized, formal seed sector. In Africa, seed-system experts estimate that such institutional channels may supply farmers with, at most, 5% of their seed, the obvious exception being maize in areas where hybrids are widely used.
9. The report ends by sketching the full components of a seed system and their interlinking relationships. Continuing to deliver seed-and-tools may be analogous to putting a band-aid on a gushing wound. Only a more-targeted diagnosis can lay the foundations for more-targeted interventions—interventions that have longer lasting positive impacts.

Section 1

INTRODUCTION AND OVERVIEW

Report goals

This report has modest, yet focused, goals. It aims to examine the effectiveness of a single season of emergency seed aid, delivered in Kenya during the 1997 'Long Rains' (from February to June). It examines the *internal process and effects* of the seed-aid intervention as it unfolded in four different regions, through the Government of Kenya (GOK) and through two nongovernmental implementers. Internal process and effects refers to such issues as the appropriateness of the crops and varieties distributed and the targeting of seed-aid recipients. Equally, this study considers the external process and effects of seed aid and examines how the seed-aid intervention did (or did not) help farmers overcome what looked like an acute stress situation (that is, a reduced harvest due to marked drought). An examination of the *external process and effects* looks at the effectiveness of the aid in the context of the farmers' broader agricultural management strategies and asks whether the seed helped farmers get back on their feet and re-establish a sustainable mode of accessing desired seeds (see Annex I for terms of reference for the study). Much of these analyses come from a previously unheard viewpoint: the perspective of the end-user—male and female smallholder farmers.

This report also has a second main goal. Using the Kenya case study as a grounded base, it aims to stimulate the development of conceptual models, management guides, and practical tools for sharpening external interventions in the area of seed-system support. The term *seed system* refers to the range of components that make a seed system sustainable. This includes all phases from seed and variety testing, to multiplication, to different channels of distribution and storage. Each phase embraces technical and social organizational forms—operating at levels from the household upwards. Finally, we include in the notion of *seed system*, all systems that farmers may use—local, formal, and any intermediary/intertwined forms. (The last section of the report discusses in some depth the concept and practice of seed systems.)

Seed, the physical input planted into a field (which has genetic, physiological, analytical, and sanitary qualities), is only one critical element to sustaining a seed system—and not always the crucial one to support in times of a social or ecological disaster. Reaching this second goal, development of refined and practical tools and guides, requires longer time horizons that go beyond the finalization of this report. A first significant step has been completed in the convening of a workshop from June 21-24, 2000, in Kampala, Uganda, entitled "Targeted seed aid and seed system interventions: Strengthening small farmer seed systems in East and Central Africa." This workshop drew together a group of seed-system and disaster-management specialists to forward our understanding of (a) how to characterize the components of seed systems, (b) how to distinguish among different kinds of seed-system stresses (with accompanying indicators), and (c) how to start to link a more accurate diagnosis of seed-system stress with a more targeted method of outside intervention support. (Annexes 5 and 6 contain the seminar program and list of participants, respectively.) Case studies were drawn predominantly from East and Central Africa (Uganda, Sudan, Kenya, Somalia, Democratic Republic of the Congo, and Ethiopia), but lessons were also drawn from key, more far-flung sites, such as Honduras (the Hurricane Mitch interventions).

The Kenya Seed Aid report and the complementary workshop (funded also under grant #LAG-4111-00-3042-00) both aim to encourage thinking beyond what have become somewhat simplistic or seed-and-tools interventions.

The problem

Every country in the Horn of Africa has experienced drought, civil disturbance, or both within the last 10 years, with many regions having experienced stress on a near continuous basis (for example, the Democratic Republic of the Congo, Burundi, and northern Rwanda). A pessimist might say that instability—rather than its opposite—is becoming the norm for East and Central Africa. One of the results of the prolonged turmoil is that repeated 'emergency interventions' are taking the place of needed longer-term research-and-development (R&D) programs.

Along with disasters, either natural or man-made, have come increasing infusions of both food and seed aid. For instance, as this report is being written, the Government of Kenya has called for US\$ 100 million in food aid and US\$ 1 million in seed aid for a single season, and the United Nations has just appealed for US\$ 377.7 million for emergency assistance in Ethiopia, Somalia, Eritrea, Djibouti, and Kenya combined, including US\$ 8.9 million for seeds and other agricultural needs (Dehai-news 2000).

Seed aid, as distinct from food aid, is a relatively new phenomenon in the Horn of Africa. A recent comprehensive review of seed-aid programs (ODI 1996), which interviewed nongovernmental organizations (NGOs), national agricultural research systems (NARS), government emergency branches, and international agencies, found that seed aid—or specifically, *seed-and-tools*, which represents the dominant form of seed aid—is a concept of the last 10 years.² Reviews of relief and rehabilitation journals (e.g., *Disasters*), operational manuals, and a range of personal communications from field practitioners) also show that the seed-aid paradigm has developed squarely on the tracks of food-aid procedures. Seed and seed-system support has yet to be seen as something fundamentally different from food aid and food-assistance support.

Repeated drought in Kenya over the last 10 years has resulted in repeated, near continuous distributions of seed aid. Since 1993, when a government body, the Emergency Drought Recovery Programme (EDRP), was first formed to deal with the effects of drought in arid and semi-arid areas, yearly seed-aid distributions have taken place across a broad range of Kenyan ecologies. Government structures have also responded to the (perceived) increasing frequency of drought by starting to construct preparedness units, such as district-level drought-emergency plans and district disaster-relief committees.

Drought is not a new phenomenon in Kenya. One specialist describes 18 significant droughts in the century between 1883 and 1984—about one every five-and-a-half years (Downing et al. 1989). Most evidently, drought is related to fluctuations in weather patterns and, hence, local water availability. However, equally important is that this 'lack' has to be linked to specific spatial and temporal parameters associated with the resource base that communities access. For example, whether the amount of land farmers have access to—and from which they can get a harvest—has remained constant (Sandford 1979).³ Landholdings in Kenya have decreased over the last 20 years, perhaps by as much as 15% for smallholder farmers (author's estimate). *Drought* or its acute effects may be becoming more common largely 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).

The history and importance of seed aid in Kenya

The decade of the 1990s

Seed aid has been distributed by the Government of Kenya on a relatively large scale since 1992. In fact, there has been a distribution nearly *every* season since then. While there may have been isolated seed-aid efforts by NGOs in single regions or sites before 1992, Ministry of Agriculture records (complemented by international organization and NGO oral histories), suggest the concept and practice of seed aid in Kenya dates back only eight years or, at most, 16 seasons.

During this consultancy, it did not prove possible to trace the exact amounts of aid or crop/variety profiles delivered during the different governmental seed-aid interventions. While official records clearly published the amounts requested, delineated by province and by crop, managers attest that funds received were routinely below those requested and that the crops/varieties requested were often not those in stock at the Kenya Seed Company (KSC), which is the near total supplier of government-coordinated seed aid. (One reason for this bias may be that the KSC offers the GOK seed against credit.) Thus, while official district and MOA requests included seed aid in the form of sorghum, cowpeas, or beans, it was overwhelmingly hybrids and vegetable seeds (onions, kale, tomatoes)—that is, more commercial crops—that have been received on a dependable basis from KSC during the last eight years of emergency assistance.

Government seed distribution, Long Rains 1997

For the period under intensive review, Long Rains 1997, Ministry of Agriculture (MOA) records document the amounts delivered on a nationwide basis (table 1).

Records from the Office of the President (OP) further give some interesting insights into the importance of government seed-aid seed in relation to the total seed planted in a given district. Among the eight districts (out of 46) which filed final seed-distribution reports in 1997, the range in importance of seed aid was impressive, with government maize-seed aid accounting for an area ranging from small (6%) to large (54%) (table 2). These kinds of statistics, however imperfect or incomplete, are important for assessing just how vital outside aid was (or was not) in the various regions.

A similar table (table 3) has been constructed for data reported to the Office of the President on other crops, notably vegetables and rice. The number of cases is too small to draw firm insights, but it looks as if government aid has been a vehicle for promoting vegetable gardening during emergencies.

Table 1: Seed distributed as aid by the GOK, Long Rains 1997

PROVINCE	MAIZE (Tonnes)	ONIONS (kg)	TOMATOES (kg)	KALE (kg)
Eastern	631.0	762	530	233
Rift Valley	539.5	563	405	218
Nyanza	174.0	80	50	48
Central	266.0	50	27.5	38
Coast	88.0	-	-	-
North Eastern	26.0	-	-	-
Western	34.0	18	15	17
Total	1758.5	1473	1027.5	554

Source: Ministry of Agriculture. Seed distribution sheets provided by Food Crops Research Department

Table 2: The relative importance of maize seed aid against total areas planted, 1997

DISTRICT	Area planted with government maize-seed aid	% of total district area maize planted from seed aid
Tana	319.0	36.5
Koibatek	3,200.0	31.3
Mwingi	1,441.2	9.3
West Pokot	2,976.0	12.4
Kwale	799.0	53.8
Kajiado	1,648.0	6.4
Keiyo	2,880.0	15.2
Busia	960.0	9.3
Total	14,223.2	13.3% (average)

Source: Office of the President.: tally of raw data sheets, by District, entitled : "Final Seed Distribution Report (n.d. -- for Long Rains 1997)

Table 3: The relative importance of vegetable seed aid against total areas planted, 1997

DISTRICT	Area planted with government vegetable-seed aid	% of total district area vegetables planted from seed aid
Koibatek	260.0	100.0
Kajiado	274.3	24.4
Keiyo	420.0	46.7
Busia	93.0	35.6
Tana	176.0	25.6

Source: Office of the President.: tally of raw data sheets, by District, entitled : "Final Seed Distribution Report (n.d. -- for Long Rains 1997)

In brief, seed aid has been delivered on a fairly large scale about every other season, and across a large number of districts. The focus has been heavily on maize across regions and years.

Seed aid versus food aid

In introducing and exploring the theme of seed aid, it is important to highlight how distinct it is from food aid. The qualities that distinguish seed are different from ones that identify food: seed occupies a central role in the *farming* (not just digestive) system, and seed aid in general is probably costlier for all actors than is comparable food aid. These points are elaborated below and each should dramatically affect how such aid is operationalized.

Seed as distinct from food

Seed in itself is not intrinsically useful. To provide benefits to the farmer, it has to be adapted to the immediate biophysical environment and adapted to farmers' potential management levels, which include not just labor but access to potentially critical inputs (manure, fertilizer, etc.). Seed also has a built-in, often narrow, time limit for usefulness: if not planted in just the right seasonal intervals, it may not germinate, or mature, or survive a drought.

Seed is also not a product whose value may be immediately visible. While analytical purity and sanitary quality can be sometimes visually assessed, genetic and physiological traits often become apparent only after the seed is planted and first emerges (ODI 1996). Therefore, the procurer has to have unusual expertise—in both the characteristics of the variety/seed and the specific contexts in which it might be sown.

Seed interventions take place at the heart of a farming system

Seed interventions affect the heart of a farmer's agricultural system. They affect a farmer's programming (of land, labor, intercropping patterns) and they tie her to a routine that assumes a certain stability—that what is sown can be harvested, five months or even up to one year later.

Although seed is often given under the rubric of short-term intervention (the 'seed-and-tools' paradigm), its effects on the agricultural system can be significantly long-term. Under a positive scenario, farmer-appreciated varieties may be sown season after season (at least for the self-pollinated crops; hybrids have built-in self-destruction). Under a negative scenario, poor seed can spread disease for a season or two. More dramatically, seed aid given again and again can alter the profile of farming systems and even render them less stable. The widespread distribution of maize in the southern regions of Africa has certainly been blamed for this latter effect (van Osterhout 1996).

Seed is more expensive than food for all actors

Logically, it would seem that seed aid is more expensive for all actors involved (although follow-up calculations still need to be made).⁴

For the donor, a good-quality variety or seed is more expensive per unit than what one would buy for grain. The process of delivery is also costlier if one aims to both target the 'seed-short' populations and couple the crop/variety with a compatible agroecological environment. Simply put, more 'niches' (and hence, the delivery of more 'niche products') need to be considered than is necessary with a blanket food distribution, or even a targeted one. The window of delivery time is also more narrow (discounting food-aid situations where populations are in critical distress).

For the farmer, seed aid is certainly not a 'no-strings' gift. It uses up the farmer's land and labor at critical moments. Planting seed and tending the growth/harvest periods has several kinds of opportunity costs. Seed aid may substitute for other crops/varieties that the farmer could also have sown. And seed-related activities take scarce time away from activities that are not seed-related.

Finally, seed aid is especially expensive when it has to be repeated. One of the key rationales for giving seed aid versus just food is that it can help farmers get back on their feet to produce their own food in the not-so-near future.

It is clear that the rendering of usable seed aid is a formidable task. Also given the huge amounts spent on seed aid, it is odd that relatively few in-depth analyses exist for guiding such operations. The how-to guides known by the author are all very recent—and variable in their coverage of themes and quality (ODI 1996;

Johnson 1998). Seed-and-tools sections, *per se*, do exist in a number of larger manuals (USAID (BHR/ OFDA/PMPP), 1997; Concern, n.d.), yet, in their simplicity, perhaps they risk being more counterproductive than helpful.

Two fundamental tenets on seed aid shape this report. First, the purpose of seed aid should aim to jump-start farming communities back into a self-help mode. As elaborated by ODI (1996):

The rationale for seed provision during and after emergencies is that it can re-establish a 'self-help' mode within communities affected by emergencies. Once families have basic seed and basic tools, they can start the process of producing their own food and/or making money from selling crops.

Second, while seed aid is often given under the rubric of 'emergency' support, by its nature, the giving of *seed* has to be put within a developmental and/or recovery context. Something planted today, during an emergency, may bear fruit five to nine months later in a changed context. If re-sown, seed can have socioeconomic, production, and bio-environmental effects for several years onwards.

Rationale for case study of seed aid in Kenya

Seed aid, as truly distinct from *food aid*, is a relatively new type of intervention, and there have been few evaluations of it. This Kenya case aims to explore some of the strengths—and constraints—imposed by seed aid, as well as to reflect on the paradigm of seeds-and-tools itself. In the immediate context, this type of analysis aims to make the process and product of seed aid more effective, especially for the beneficiary—the smallholder farmer. However, the longer-term goal of such an analysis is to reduce the need for emergency seed assistance, through defining strategies that both (a) strengthen seed systems themselves and (b) build a capacity for a more locally based seed response.

Report layout

The next section presents the general methods used in the study. Section 3 then analyzes the internal process and effects of seed aid in 1997. Section 4 provides the external complement, looking at the longer term of 'external process and effects' of seed aid. Based on such insights, section 5 offers insights into characterizing different types of seed-system stress and ways of linking more targeted action to stress.

The four site cases are discussed and contrasted so as to learn from their differing strengths and challenges. No direct comparisons or judgments should be made, as the implementers' contexts for giving seed aid varied greatly, for example, in terms of scale, funds available, and flexibility to act at all phases. The aim of this overall study is to construct a set of scenarios for better practice.

Summary: Key Points

1. Seed aid, as distinct from food aid, is a relatively new phenomenon in the Horn of Africa (within the last 10 years). Seed aid and seed-system support has yet to be seen as something fundamentally different from food aid and food-assistance support.
2. Seed aid is different from food aid in at least three key aspects:
 - Seed is not intrinsically useful. It has to be adapted to the immediate biophysical environment, as well as to farmers' potential management levels. It also has a built-in, often narrow, time limit for usefulness: if not planted in just the right seasonal intervals, it may not germinate, mature, or survive stress periods.

- Seed interventions affect the heart of a farmer's agricultural system. They affect the farmer's programming (of land, labor, intercropping patterns) and they tie her into a routine that assumes a certain stability. Further, although seed is often given as a short-term intervention (the seed-and-tools paradigm), its effects on the agricultural system can be very long-term.
 - Seed is costlier than food for all key actors (farmers, implementers, donors).
3. In Kenya, seed aid has been delivered on a fairly large scale—since 1992, about every other season and across a large number of districts. The focus has been heavily on maize across regions and throughout the years.
 4. The case study examines the internal process and effects of seed aid delivered during the Long Rains 1997 (February to June), along with the external process and effects:
 - *Internal process and effects* refers to such issues as the appropriateness of the crops and varieties distributed and the targeting of seed-aid recipients.
 - *External process and effects* examines how the seed-aid intervention affected farmers' broader agricultural-management strategies and whether the seed helped farmers get back on their feet and establish a sustainable means of accessing desired seeds.
 5. Much of these analyses draw from the perspective of end-users: male and female smallholder farmers.
 6. Two fundamental tenets of seed aid are proposed:
 - The purpose of seed aid is to jump-start farming communities back into a self-help mode.
 - Seed aid *has* to be put within a developmental and/or recovery context. Seed sown can have socioeconomic, production, and bio-environmental effects for several years onwards.

Section 2

METHODOLOGY

Sources and overview

This report draws information and insights from varied sources. Substantial written documentation was provided by all direct collaborators: the Government of Kenya, Ministry of Agriculture, Office of the President, Kenya Agricultural Research Institute (KARI), Catholic Relief Services (CRS), the Diocese of Embu Parish, and German Agro-Action (GAA). This information encompassed in-house logistical notes and correspondences, operational reports, and select internal program evaluations spanning the emergency program cycle (from first stages of problem identification through to post-intervention assessments). Direct interviews were held among seed-aid managers and planners at various levels of operation (key personnel of the Office of the President and Ministry of Agriculture, NGO managers and individuals who designed specific emergency and development field activities, church leaders, and development/relief field staff) (see Annex II for a list of persons contacted). Extensive interviews were also conducted with end-users, beneficiaries, or local decision-makers. Some 171 farmer interviews were conducted in the four main sites of Machakos, Makueni, Embu/Mbeere, and Baringo, with a pre-test phase taking place at a fifth site (Thika).

Choice of sites

Four sites were chosen for carrying out intensive farmer interviews (Annex III lists specific locales). These sites were selected to provide a basis for discussing and contrasting aid delivery by a variety of organizations with slightly different seed-system support approaches in similar agroecological contexts. The choice of sites was also heavily dependent on institutional interest in collaboration. Only if implementers were open to an intensive evaluation of their activities—an exchange of insights—were sites considered. This study was partially designed to stimulate self-reflection.

Table 4 sketches the key parameters of the sites—all in areas where there had been some seed-aid distribution. These tend to be smallholder areas with lower, sporadic rainfall. In Baringo and Machakos, the implementers were Ministry of Agriculture district staff. In Mbeere/Embu, the Diocese distributed the seed aid, with financial and some technical support from an NGO, Catholic Relief Services. In Makueni, German Agro-Action, another NGO, was the key implementer. GAA had initiated an extensive program in strengthening the seed system prior to drought, starting in 1995. Their aim was to maintain nutritional standards partly by diversifying crops and improving methods of local seed production. This prior development activity proved to be critical in their making better-targeted and -informed interventions during emergency periods.

Table 4: Field sites chosen for study of seed aid given long rains 1997

4.1. Government-implemented seed-aid sites

MACHAKOS	BARINGO
Implementer: MOA	Implementer: MOA
Semi-Arid UM4 'Sunflower-Maize Zone' 700-800 mm annual rainfall	Semi-Arid LM5 'Livestock-Millet Zone' 650-950 mm annual rainfall
	Focused on farmers with access to irrigated plots
gave seed	gave seed

4.2. NGO-implemented seed-aid sites

MAKUENI	EMBU/MBEERE
Implementer : NGO German Agro-Action	Implementer: Church and NGO Embu Parish with support from Catholic Relief Services
Semi-Arid LM5 'Millet-Livestock Zone' 600-800 mm annual rainfall drought common	Semi-Arid (with variation from medium to lower potential) LM4/LM3 'Marginal-Cotton Zone' 780-900 mm annual rainfall
gave seed plus: organized farmers in groups skill building in seed production	gave seed

Note: LM signifies land management category (Ministry of Agriculture).

Specific methods used

1. Fieldwork process among farmers

Direct interviews with farmers were carried out in July 1998. University and professional enumerators were first trained in a two-day workshop along with a two-day pre-test. In Machakos, Makueni, and Baringo, sampling of those to be interviewed was done randomly, within general zones where seed aid was recorded to have been distributed in 1997. In the other two areas (Embu/Mbeere and Thika), the intermediary organizations provided detailed lists of farmers who had supposedly received seed for the 1997 Long Rain season.

Interviews were always conducted in the local language (which often was not Swahili) and lasted about one hour each. Both male and female farmers were interviewed, with both men and women on the interview team. The 1997 Long Rain was chosen as a season for specific study because the last aid package was given at that point in time and it was close enough to remember in some detail. While the sample of 171 farmers may be too small to extrapolate for national or even regional statistical analysis, the sample was unusually large for the intensive interview format adopted. Certainly in terms of farmer insights, this analysis is the most complete one on the process and effects of seed aid in Kenya to date.

2. Consultation with wider body of seed-aid practitioners

In pre-fieldwork visits in both February 1998 and June 1998, a wide range of aid organizations, disaster-relief specialists and agricultural managers were consulted (see annex 3). Individuals were given ample opportunity to comment on the terms of reference, the project design, and the initial findings. This was done both through private communication (rendezvous, email) as well as in organized public meetings (see point 4 below).

3. Review of literature

Most of the more-informed publications on seed aid and seed-system relief (in both the official and gray literature) are products of the last five years. We used the term *informed* to refer to reports/documents that recognize the complexity of small-farmer seed systems. They recognize that farmers may rely principally on their own seed systems (sometimes called farmer, local, or informal seed systems) or draw principally from formal seed systems (depending on the crop)—or a combination of the two. Informed seed-system perspectives also recognize the dynamic between social aspects of seed systems (e.g., is your neighbor going to lend you the seed or not?) and its technical dimension (varietal choice, aspects of seed quality, etc.). Some of the literature reviewed is directly cited in this report. A more extensive bibliography will appear in the compendium workshop proceedings on "Targeted seed aid and seed-system interventions: Strengthening small-farmer seed systems in East and Central Africa."

4. Public meetings during stages of design and results analysis

A public pre-study preparatory and familiarization meeting was held in Nairobi at the Kenya Agricultural Research Institute (KARI) on March 13, 1998. Similarly, a public pre-closure was held at the same institute on June 26, 2000, to discuss results and interpretations among collaborators—before finalization of this report. These public consultations very much affected the design of the initial program as well as the interpretation of results. Meetings were attended by a range of organizations: for example, representatives from USAID, The World Bank, The Rockefeller Foundation, the Office of the President, scientists from international agricultural research centers (CIAT and ICRISAT), scientists from KARI, and personnel from NGOs (CRS, GAA, and World Vision).

5. Workshop interchange among 'experts' and direct report users

Finally, a workshop, held in Kampala in June 2000, served as a sounding board for presenting the preliminary results of this Kenya seed study. As the workshop brought together seed-aid and disaster-relief specialists working in East and Central African regions, the seminar served to contextualize the Kenyan cases amidst a wider range of similar relief actions in such countries as Somalia, Sudan, Rwanda, Uganda, and the Democratic Republic of the Congo.

Summary: Key points

1. Intensive analysis was done at four sites where seed-aid distribution took place in 1997 (Machakos, Baringo, Makueni, Embu/Mbeere). The sites were chosen to provide a basis for discussing and contrasting aid delivery by a variety of organizations (government and NGO) with slightly different approaches to seed-system support in similar agroecological contexts.
2. The methods encompassed extensive field interviews (171), a literature review, broad consultation with seed-aid practitioners, two public meetings, and a targeted workshop bringing together seed-system analysts and disaster-management specialists.

Section 3

THE INTERNAL LOGIC OF SEED AID: LONG RAINS 1997

Of the 171 households interviewed, 133 (77.8%) received seed at the four sites (including the test site). This section draws on both groups—the receivers and non-receivers of seed—when summarizing qualitative insights and reflects on the internal process and effects of the seed-aid distribution. This 'internal' type of analysis is sometimes programmed in a follow-up action by governments (see, for example, Anon. 1997) or implementing NGOs (e.g., CRS/Kenya-DRI 1997). Taking place shortly after implementation (either 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. This internal evaluation of a seed-aid intervention may be used to help sharpen the process of giving seed aid in future delivery periods, once the decision has been made to embark upon a seed-and-tools program.

Products of seed aid: Farmers' perspective

Crop and variety choice

Table 5 shows the crop profile of seed aid given in 1997 at each of the four sites. At the government-managed seed-distribution sites, Machakos and Baringo, farmers generally were provided maize and some beans, as has been the trend since the beginning of seed-aid distribution in 1992 (see GOK/MOA seed-aid lists). In addition, aid recipients in Baringo, most of whom had access to irrigated plots, received a range of vegetable seeds. These latter crops are key for income generation by supplying more greens to urban markets.

Maize and beans also were given at the NGO-managed distribution sites, Embu/Mbeere and Makueni, though to a significantly smaller proportion of farmers. As all four sites are semi-arid and prone to the effects of drought, the NGOs, both GAA and CRS, have been working to diversify the crop profile of farmers in their zones of action. Within the scope of seed-aid distribution, both promoted more drought-tolerant crops, such as cowpea, millet, green gram, and pigeon pea. While all the crops given as aid in these latter sites are known to farmers, few listed them as among their priority crops (see section 5). The diet of Kenyans, even in these drought-prone areas, is very much rooted in maize and beans, however vulnerable their actual production may be.

From the farmers' perspective, the crops given as seed aid (table 6), as well as the varieties (table 7), were appropriate. It proved unnecessary to disaggregate these data by site, given the high coincidence among responses. Interviews showed that farmers, fundamentally, expect maize and beans for seed aid, although in some of the drier areas, additions such as sorghum and cowpea are acceptable as long as maize seed is one of the elements in the aid package. (Most farmers were given two different crops as seed aid during the same season.)

Table 5: Aid crops received by farmers: Long Rains 1997 (percent of farmers at each site receiving given seed-aid crop)

CROP	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Maize	40.0	63.6	82.9	75.0
Beans	16.7	18.2	65.7	7.1
Sorghum	33.3	54.5	17.1	
Millet	23.3	12.1		
Cowpea	53.3	33.3	5.7	
Pigeon pea	6.7			
Green gram	6.7			
Onions				14.3
Kale/Cabbage				7.1
Tomatoes				10.7
Other vegetables (commercial)				10.7

Table 6: Farmers' assessment of the crops distributed during the emergency situation, Long Rains 1997, in response to the question, "Were they the appropriate crops?"

CROP	No. of farmers receiving this type of crop aid	YES (%)	NO (%)	No Opinion/ Don't Know
Maize	91	97	2	1
Beans	43	95	2	2
Sorghum	34	97	3	-
Cowpea	29	97	3	-

Table 7: Farmers' assessment of the varieties distributed during the emergency situation, Long Rains 1997, in response to the question, "Were they the correct variety of the given crop?"

CROP & VARIETY	Number of farmers commenting on variety	YES %	NO %	No Opinion/ Don't Know %
Maize	91	96	3	1
Beans	43	86	2	12
Sorghum	34	94	6	-
Cowpea	29	93	7	-

However, the satisfaction of the majority does not mean that all farmers were content with the aid package. Selected comments signal areas of concern. Several farmers from the Embu/Mbeere sample mentioned how risky the maize hybrids may be in more marginal zones (numbers in parentheses indicate the number of the farmer interview): "When we are given relief and there is a decline in rainfall that season, we don't get a harvest" [No. 32]. "The seed-relief aid during the emergency period has been good—but only if the rains are there" [No. 23]. "The maize varieties from seed relief and from the stockist are less adapted to the environment than our local variety" [No. 20].

Further, in Machakos, the possible inappropriateness of the aid, in relation to smallholders' means of production was highlighted: "Seed relief should be complemented with fertilizers so that the seed given as aid isn't wasted by some poor farmers who can't afford fertilizers to get a good yield" [No. 55].

Finally, even some of the positive comments relating to farmers' satisfaction with what they received question whether this seed aid was serving the goals traditionally expected in emergency situations. The following examples of comments raise basic concerns about what seed aid achieved (numbers in brackets indicate the number of the farmer interview).

From Makueni sample:

"It is a way of bringing new varieties of early-maturing crops to me and my neighbors." [No. 129]

From Baringo sample:

Seed aid introduces farmers to new crops and new varieties. [Nos. 107, 156, 157, 165]

"Because of seed aid, I now know about onion farming." [No. 172]

"Seed aid is how can I get maize seed from my farm without going to a stockist every season." [No. 155]

"Because of seed aid, my farming has been improved: I have learned how to plant properly, how many seeds per hole, time of planting." [No. 112]

"As an incentive [to get seed aid] you have to prove your worth in terms of farming methods utilized." [No. 159]

From Embu sample (showing seed aid is equated with receiving something new or 'progressive'):

"Seed aid should be accompanied by technical advice on spacing, fertilizer, and other practices. There are instructions on the package, but they are in English." [No. 1]

From these comments, we see that seed aid has saved farmers money for certified seed, introduced new varieties, introduced new crops, and introduced/stimulated progressive farming practices. All of these may or may not be important—but are not necessarily related to alleviating acute stress.

Quality of seed received

Across sites, both the quality and germination properties of the seed given were deemed remarkable (table 8). Simply put, most farmers have not used certified seed—or only when given it free. In the case of maize, the seed aid, which consisted primarily of hybrids (the 500 series and 600 series) and the composite variety Katumani, was also highly valued because most farmers (except in the Baringo sample) did not routinely sow hybrids (see section 4 on routine procurement sources for further discussion).

Unlike many seed-aid situations, farmers in this Kenyan sample recognized 'the value' of the seed commodities delivered, but not necessary just for direct sowing. Farmers repeatedly mentioned how easy it is to exchange the two-kilo package of maize for an item that might be more urgently needed (for example, staples such as salt, sugar, and oil). Seed aid in this sense is achieving a 'currency function' beyond its more immediate sowing (and hence production) value.

Table 8: Farmers' assessments of the quality of the seed received*

FEATURE	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Seed Quality vs normal seed	Better = 72% Same= 25%			
Germination vs normal seed	Better= 70% Same= 27%			

* Given their similarity, responses were combined across all four sites

Percentage of seed aid sown

How did these farmers' subjective assessments of the appropriateness of seed compare with their actual practices? At least according to farmers' testimony, the great majority of the aid seed was sown—across crops and across locations (table 9). For instance, 85% of farmers sowed all (100%) of the maize seed they received as aid, while 72% of those receiving cowpea sowed all (100%) of this crop given as aid. 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. Reading the table, 83% of those who received sorghum seed sowed at least half of that aid given.

Table 9: Percent of seed aid received that was actually sown by farmers (by crop)

Percent level of seed sown	100	99-75	74-50	49-25	24-1	0
Maize (N=91)	85	4	5	1	1	3
Beans (N=43)	88	-	-	2	5	5
Sorghum (N=34)	56	6	21	6	6	6
Cowpea (N=29)	72	13	4	7	-	6

Process of seed aid: Farmers' perspective

The process of seed-aid delivery during the 1997 Long Rains proved more problematic for farmers for several reasons: the timing of delivery, farmers' perceptions of how beneficiary-targeting took place, and their valuation of the actual amounts received.

Timing of delivery

While seed arriving late is a common complaint across seed-aid interventions, in Kenya in 1997 it appears that the process was given an unusually late start due to the delay in announcing an official emergency—the end of January 1997 (CRS-Kenya/DRI 1997). Funds for seed purchase and transport cannot be raised until an official emergency is declared. Only GAA in Makueni, which had a prior seed-assistance program on site, was able to deliver most of their aid punctually (table 10).

Table 10: Farmers' assessments of timing of seed-aid delivery, Long Rains 1997 (percent of responses)

Site	N	In Advance	On Time	Somewhat Late	Too Late
Makueni	30	27	30	3	-
Mbeere/Embu	33	12	36	24	27
Machakos	35	3	11	51	34
Baringo	28	32	36	18	14

Targeting

The official rules (theory) of targeting proved very different from 'better practice' in the Kenyan situation—and caused some discontent. Here, we review both the theory (what is written officially) and how targeting actually unfolded. For seed aid, targeting challenges are basically twofold: (a) to identify those who actually need seed aid *and* (b) to ensure they have the means to use it (that is, the land and labor necessary for sowing, and sufficient stability to guarantee that seeds planted are harvested). More fundamentally, however, policymakers have to decide what the seed aid is for—that is, what goals it wants to achieve—and this must be done prior to choosing techniques of targeting. This is unclear in both the official rules and subsequent practice, as is seen below. Targeting aid to sustain the chronically seed-poor is different from helping those temporarily in seed stress, and it is different from using seed aid to introduce new varieties and to further catalyze the efforts of more progressive farmers.

1. Targeting seed aid: The view of the dispenser

Both government and church officials are well aware of some of the seed-targeting challenges and problems. There are official guidelines—and then there exists actual practice, i.e., what they predict will occur.

Guidelines

The official guidelines elaborate criteria for recipients of seed aid. The list below is taken from both government and church documents.

Government documents:

- MOA: Those in need of seed and who cannot purchase seed themselves
- MOA: Land should be ready to cultivate and ready for planting
- MOA: Beneficiary should (if possible) have purchased enough fertilizer
- MOA: Beneficiary should plant seed strictly according to the recommendations of the area agricultural assistant
- MOA: To ensure that the maximum number of people benefit, each farm family will get only one type of seed
- MOA: [allotment according to farm size] e.g., a maximum of one 10 kg/bag per person [household]. If farm size less than 1 acre, then the amount should depend on farm size cultivated, i.e., 5 kg per 1/2 acre cultivated
- MOA: Targeted according to the region's potential and farming acreage

Church documents (Diocese of Embu): The poorest—those in need of seed aid are considered the same population as those in need of food aid:

- those who have *not* received relief through government or any other relief organization
- those who cannot obtain seed through other means
- those who have prepared a minimum of 1 acre of land
- those who have prepared land but have no seed

With the Church, there is usually a two-tier process of selection. The seed-needy are identified within what is already considered a vulnerable agroecological zone. However, it is not clear whether the seed-needy within higher-potential/less-vulnerable zones are also targeted with seed aid.

2. Seed-aid targeting methods used in Kenya for reaching beneficiaries (from interviews)

The written guidelines listed above contrast with what actually unfolds. Several government officials were particularly frank about the challenges of actual targeting. They want both clearer mandates and more 'rough and ready' tools to select recipients.

Reflections of field-level government officials on actual practice

1. In theory, 'needy lists' are drawn up through local committees: Social Dimensions Development (SDD) Committees, Drought Disaster Preparedness Committees, Local Development Committees—and sometimes by the Chief.

In practice:

- It is hard to exclude anyone. Usually a *baraza* (local meeting) is called and those who want seed present themselves. Frequently, pre-packaged seed (in 2-kg and 5-kg packages) needs to be opened to accommodate increased demand. One officer commented, "Not unusually, a very needy person may get but a cupful of seed. Sometimes it is so little, they say, 'I don't even want that.'" Farmers themselves also help to corrupt the process away from its original goals, saying, "Everything free from the government should be for us all."
- Local committees may be highly political in choice of beneficiaries. Many non-needy are included as seed aid comes increasingly under the rubric of a 'government gift.' Also, elected officials have a vested interest in ensuring that their own constituencies are well-served—whether they are in need of seed or not.
- The social pressures are such that those who receive may be obliged to redistribute to those who do not. Government officers insightfully remarked that the poor could be disadvantaged in the long run if they did not share with others. They are involved in social networks of help. So, if they

don't share seed, neighbors won't help them with other activities, such as labor exchanges: "You get free seed and don't share with me—don't come to me for other help."

2. In theory, there is an analysis of need and beneficiaries through identification of local zones where there are production shortfalls. Percentage shortfalls are estimated (e.g., from 5 T/ha to 1 T/ha), vulnerable zones are identified, and then a percentage of the 'needy' is suggested (e.g., "20% of the population in this zone probably cannot buy seed on their own").

In practice:

- The basis for estimating the percent of seed needed within a zone is not clear. Seed needs are calculated on the basis of vague acreage estimates of crops in the given zone during normal times. For example, the seed needs are extrapolated by multiplying recommended sowing rates by estimated total area, then divided by a seemingly arbitrary percentage of 'seed-needy,' i.e., to cover 20% of the acreage of crop x in zone y, then 20% of the acreage is assumed to equate with 20% of population.
- Officials also frankly admitted they rarely have the resources to travel across their zones to see the full variability in harvest performance.
- In brief, government officials well recognize that there are significant political, social, and technical constraints to targeting well. The political and social pressures are especially embedded and will be difficult to alter. Officials also admit that *not* targeting often results in too little seed being received by the truly needy.

3. Targeting seed aid: Farmers' perspective

By their range of complaints ("too little seed because too many receive"), farmers also see the targeting issue as a challenge that needs to be better addressed—sooner rather than later. Over 20 different criteria by which farmers thought the need had been targeted (or not) were given from among the 133 farmers who received aid (table 11). Clearly, there is need for a great deal more transparency in choosing seed-aid recipients; the lack of clarity is creating frictions within communities.

Table 11: Farmer-perceived criteria for those who received seed aid in 1997: overview

1. Those belonging to organized farmer groups/women's groups
2. All who went to chief's *baraza*/all who went to agricultural extension meeting
3. Those who were unable to buy own seeds
4. Those identified by Relief Committee/Assistant Chief/Village Chief
5. Those sponsored by aid agency (e.g., Plan International)
6. Old people/"The 'old man' (chief) then gave the rest to his sons"
7. Farmers who adopted techniques of extension staff
8. Best farmers ("If she well-prepared her farm, she got more")
9. One member from each family
10. All were given
11. Farmers were given according to land size
12. Only Catholics (refers to church-related dispenser)
13. List written down by Church. It included Catholics and non-Catholics
14. Small fee charged per kilo. Then those who went to church and paid, received
15. Anyone who presented himself/herself at Church
16. Through Church Committee
17. Friends of distributors
18. Seed given for work
19. Groups trained in seed-production techniques and given seed (self-help)
20. Chosen by extension agents
21. Farmers ready to plant, because seed came late
22. Old widows were selected
23. Anyone who got food aid received seed aid
24. The needy and the contact farmers
25. Bribery
26. The needy were chosen against land register

Unfortunately, and particularly because the seed distributed by the Government is perceived to be of such elite or exotic quality (certified maize hybrids), the general rationale for seed aid is not clear-cut for many. The notion that 'the best farmers' should get the seed or that 'all citizens should get this gift' does not fit well with normal visions of who should receive seed aid in times of stress.

Table 12 further refines perceptions of what types of farmers received seed aid, by site.

- *In Makueni*, the implementer GAA strove to give aid to those organized into groups—who could continue to produce seed on a longer-term basis.
- *In Embu/Mbeere*, farmer complaints suggest that Catholics were given preference and that some not deserving seed received substantial amounts. In the zones sampled, Church leaders themselves seemed unusually well-informed about grass-roots developments and reiterated these same targeting concerns. Well-kept Church records (name, ID, village, religion, seed types, date received) also noted a high proportion of recipients as Catholics.
- *In the GOK/MOA-implemented site in Machakos*, farmers were unclear if targeting went on at all (and rumors were rife).
- *In the GOK/MOA-implemented site in Baringo* (identified by the DAO), targeting seems to have followed distinctive and perhaps atypical criteria for model or progressive farmers.

Beyond these farmer perceptions, in section 5 we look at how important the seed aid received was to the beneficiaries—in terms of their total seed planted. While there were evident biases in the targeting, which had little to do with seed need, there is some evidence, particularly at the Makueni and Embu/Mbeere sites, that the recipients were indeed among those most in need of outside seed support.

That is, in both of these sites, the seed aid delivered accounted for a significant portion of the seed planted for their staple crops (section 5).

Finally, both the official guidelines and practice of targeting suggest that the goals of the seed aid may be both varied and unclear. This issue of 'what goals for seed aid' is pursued in the concluding discussion portion of this section.

Table 12: Farmer-perceived criteria for those who received seed aid in 1997 - distinctive features

Makueni	Embu/Mbeere	Machakos	Baringo
<ul style="list-style-type: none"> • Seed for Work • Groups trained and given seed (self-help) • Those belonging to organized farmer groups/ women's groups 	<ul style="list-style-type: none"> • Only Catholics • Anyone who presented himself/ herself at Church • Small fee charged per kilo • Then those who went to church and paid—received • List written down. It included Catholics and non-Catholics • Through Church Committee 	<ul style="list-style-type: none"> • all who went to chief's <i>baraza</i> [meeting]/all who turned up/all who went to agricultural extension meeting • All were given • Farmers ready to plant—because seed came late 	<ul style="list-style-type: none"> • Farmers who adopted techniques of extension staff • Extension agents choose • Best farmers: "If she prepared her farm well, she got more"

Quantity received

The quantity of aid received per recipient is, of course, a function of the total amount available and the number of those receiving any seed at all. As table 13 shows, the amounts received varied markedly, even at a single site, with Baringo having the highest divergence of 1 to 15 kilos of maize received by single farmers, and Makueni appearing to have the most equal distribution.

Table 13: Maize seed aid 1997—quantity received

	Makueni	Embu/Mbeere	Machakos	Baringo
Average amount per farmer who received maize aid (kg)	3.08	4.3	1.53	4.1
Range among farmers at single site (kg)	2-4	1-10	<1-5	1-15

Across sites, the farmers' biggest complaint about the maize received was the small quantity, with the number of complaints 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). Indeed, 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'). However, there are also substantial—and direct—costs to *not* targeting. Those most in need may receive only token help, that is, not enough to make a difference to their lack of agricultural viability.

Vouchers

Finally, we end this section on the process of seed-aid delivery by looking at the question of vouchers. Vouchers were not used during the 1997 aid intervention, although they are currently being programmed in CRS's work for the Short Rains 2000 season.

Overview

While still within the realm of 'aid,' the logic of vouchers is based on the notion that (a) farmers are better at deciding which crops and varieties most suit their needs and (b) farmers will normally procure, locally, the variety and seed material they know to be adapted to their environment. Theoretically, vouchers should also support, rather than undermine, the seed markets running locally (whether or not truly local, these are open markets or local seed shops known as 'stockists,' which sell certified seed of commercially released varieties). While seed vouchers have been tried in Uganda by Sasakawa Global 2000, their use in Kenya seems relatively unknown. During the course of the interviews, farmers were asked their views on vouchers: Would they prefer vouchers (or cash to buy seed), or did they have a preference for getting the physical seed itself during emergency handout operations?

Fieldwork showed the voucher issue to pose two very different sorts of challenges and concerns for farmers: (a) the availability of local crops/varieties even if purchasing power were guaranteed and (b) the 'will power' of farmers to use the cash/voucher for seed stocks when other needs were just as pressing (paying school fees or buying basic food supplies, such as salt, sugar, or cooking oil). It was interesting—and surprising—to note that a good number of farmers did not want anything at all for buying local seed. They voted for the seed option specifically because they equate 'aid' with the certified maize hybrids delivered in government-assistance programs. As mentioned above, at all sites sampled, such hybrids as those from the Kenya Seed Company are perceived by many as an incredible luxury good, which is not to be passed over (even *if* one has enough of his/her own seed). Table 14 quantitatively summarizes the relevance of these concerns by region. The variability in even such a small sample is intriguing, and qualitative insights are elaborated in the discussion sections below.

Table 14: As a seed-aid strategy, would farmers prefer vouchers/cash so as to obtain desired crops/varieties themselves—or seed aid itself ?

	Makueni (n=30)	Mbeere/Embu (n=33)	Machakos (n=35)	Baringo (n=28)
Prefer Vouchers/Cash	13%	58%	51%	71%
Reasons	<ul style="list-style-type: none"> • can get local seed locally—want the money or voucher 	<ul style="list-style-type: none"> • can get seed locally—want the money or voucher 	<ul style="list-style-type: none"> • can get certified maize or beans from the stockist: can get desired beans and cowpea in local market 	<ul style="list-style-type: none"> • can get 'high-quality' seed at stockist: maize, kales, tomatoes, Irish potatoes [No. 57] • can get seed at local market: watermelon, beans [No. 14]
Prefer Seed	87%	42%	49%	29%
Reasons	<ul style="list-style-type: none"> • would divert money for other purposes [No. 37] • markets too far [No. 33] • local seed not good quality [No. 17] 	<ul style="list-style-type: none"> • would divert money for other purposes [No. 30] • can't get such certified seed easily [No. 12] 	<ul style="list-style-type: none"> • would divert cash for other purposes [No. 37] • crops available in market from high-potential areas not adapted [No. 6] • market too far [No. 6] 	<ul style="list-style-type: none"> • would divert cash for other purposes [No. 7] • can't get right variety [No. 4] • seed often out of stock [No. 7] • markets too far [No. 11]

Comments on vouchers by site

- *Makueni*. In Makueni, farmers overwhelmingly said they did *not* want vouchers or cash. Only four (13%) indicated they could get the appropriate varieties and wanted the cash. Half stressed that they could *not* get the varieties they most desired, focusing on the government-certified maize seed, which is a coveted luxury product. Reinforcing this view, many also mentioned the significant costs incurred while traveling (that is, the market is just too far) and their lack of faith in the local sellers (e.g., "they mix varieties, mislabel varieties," etc). The remaining group (37%) glossed over the seed issues (potentially, they could purchase what they needed), but were simply reluctant to have the money in their pockets. Women, in particular, mentioned the fear of diverting needed seed money for urgently needed food and school fees.
- *Embu/Mbeere*. At Embu/Mbeere, relatively more farmers (58%) were predisposed to the cash/voucher idea. Unlike Makueni, few (12%) felt they could not get desired seed if they had money. (They purchase local maize varieties here, as well as cowpeas, beans, etc., and have no special attachment to the newer maize hybrids.) However, even though some confirmed they could access seed locally, a good number (30%) did *not* want the cash/voucher coupon as they feared using it for other purposes. This reluctance to have cash in the pocket serves as a rough 'informal' indicator of poverty and/or a lack of control over how the money will be used. Some also stressed how much they appreciated having the seed aid directly delivered, rather than having to walk the 10-20 km to market.
- *Machakos*. Farmers were equally divided over vouchers, primarily for reasons of economics (not seed issues). Farmers' priority crops here were mainly maize and beans, with an occasional cowpea fan. Desired varieties of maize (e.g., 511) and beans (e.g., Nyayo) are easy to get at stockists, with beans also available at the many open markets. Those who wanted seed mainly expressed concerns about diverting the voucher/cash resources elsewhere.
- *Baringo*. Farmers here voted primarily for the voucher/cash option. They use hybrid maize and commercial vegetable seeds anyway—the same they receive from relief sources. A few didn't trust themselves to spend the money as targeted (and by their comments, these were probably the poorest among the group).

Use of a voucher system: yes or no?

Analysis of the responses suggests that different kinds of farmers prefer different options, based to a certain extent on wealth. The very poorest prefer seed aid because of their fear of diverting money and because the maize hybrid is beyond their normal reach. (Whether hybrids are appropriate for such a group of farmers needs to be seriously debated.) The richer farmers—a good number of whom received seed aid—generally feel equally disposed to the two options: hybrids are what they normally use and they have little trouble reaching the stockist. The issue of distance to market (particularly in Makueni and among the aged) cuts across wealth categories, as does the concern that 'quality' seed (local quality seed as well as certified) just isn't available in local markets. In addition, in areas where the NGOs are experimenting with non-maize options, farmers sometimes prefer the seed aid, just because the crops and varieties of crops they desire (green grams, cowpeas, millet) may not be easily accessed. As one farmer stated, "Crops in the market often come from the richer agricultural zones and are not locally adapted."

The pros and cons of using vouchers are further explored in the following discussion.

Discussion: Internal process and effects of seed aid

It is important to note that the Government of Kenya and some of the NGOs have themselves previously commissioned studies to determine the internal logic of their seed aid (Anon. 1997; CRS-Kenya-Dri 1997).

One report, *Monitoring of Relief Seed Distribution* (Anon. 1977), specifically saw as its objective "to visit selected districts in Eastern, Central and Coast Provinces to monitor relief distribution and ascertain that seed was received and distributed on time, in the right varieties and reached the intended beneficiaries." The conclusions were unusually frank, but not necessarily analytically framed or targeted to audiences in a way that could encourage better practice. Some extracts follow:

Malindi district decided to target family holdings and give adequate seed for 1 acre per family—while most districts issued seed to whoever turned up.

Embu—The quantity each recipient received ranged from 1kg to 10kg. This was based on the number of farmers that turned up.

Mwingi District—The exact number of beneficiaries is difficult to ascertain as traditions in the district dictate that no one can be denied seed, thus all who turned up during distribution received at least a small quantity, estimated at less than 1/4 kg.

In the discussion section following, we aim to reflect on four central issues raised by the previous analysis of the internal delivery of seed aid: goals, targeting, vouchers versus seed, and overall organization. (Discussion of 'which crops and varieties' is included in section 5, where the fuller farming systems are brought into view.) Here, we compare and contrast lessons from the four different sites, as well as drawing from the insights of both aid practitioners and farmers, specifically to stimulate more conscious decision making in seed-aid program design and delivery.

Goals of seed aid

The goals of giving seed aid are not very transparent in the four cases analyzed. Based on analysis of practice, there seem to have been at least four different ones. 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 a needy group.
- *to encourage self-help, or for farmers to achieve a self-sustaining seed-production strategy*
This was clearest in the Makueni 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.
- *to stimulate 'progressive' modern farming practices*
The Baringo seed distribution illustrates this goal. Progressive farmers 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 in emergency stress situations. However, the multitude of goals, and accompanying approaches, created confusion among the general population about what the seed is for, and perhaps created false expectations as well as unnecessary dependencies—as exemplified in the following farmer statements.

Embu: "Seed relief aid should be given throughout the year, 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]." [No. 4]
"It is very difficult to get seeds from the local market or any other place because of the price—so seed relief should be encouraged more." [No. 7]

Minimally, the goals of a seed-aid operation should be transparent 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 of these precedes the other. Further, without a definition of goals beforehand, it is very hard to judge the effectiveness of subsequent targeting.

Among the sites visited, several targeting strategies have been noted. Programs such as the 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 Makueni, 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 criterion 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.

What is clear within the Kenyan context is that lack of clear goals for the seed aid, which leads to unclear messages about who the beneficiaries are, could create significant friction among those who dispense the seed as well as among many of the recipients. There were repeated accounts of the very needy 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.

In theory, the targeting scenario posed in this Kenya study should be a relatively easy one technically, in that the populations are physically stable (compared to refugees on the move) and have lived in their home areas for at least several seasons. Some further technical parameters would need to be addressed: how to define seed-vulnerable populations in an emergency situation, and then how to distinguish those who are experiencing *acute* seed stress (that is, stress just this season because of drought, for example) from those who are chronically seed-stressed (and require outside help nearly every season). Specific indicators and strategies for distinguishing stress populations are elaborated in the complementary volume to this report (workshop proceedings).

However, many (most?) of the challenges in remedying targeting concerns are political and/or social and lie beyond the scope of this study. In public distribution zones, populations have been given the sense that seed aid is their right and a gift from the government.

Vouchers

The question of vouchers might be best explored in a more analytical manner than has been done to date. A country-wide strategy to promote the voucher option (or not) would, *a priori*, disadvantage some farmers. In areas where stockists regularly operate and aid givers tend to give certified seed of major crops anyway, a voucher system could work well—and save money in the seed-distribution process. In areas where seed

markets function poorly (little seed, little variability in crops, few reliable seed sources for well-adapted crops), seed aid in the form of seed might actually be more effective, assuming donors deliver seed of locally adapted crops and varieties. Table 15 lays out some of the key variables important in the decision-making process about whether to give vouchers.

Table 15: Weighing the pros and cons of a voucher system-the farmers' perspective

FOR VOUCHERS as aid, if...	FOR SEED in seed aid, if...
open markets/stockists are relatively close	markets/stockists are far (or nonexistent in the area)
markets/stockists deliver crops and varieties I want to plant	markets/stockists don't stock crops/varieties I need
markets/stockists deliver good-quality seed	trust in stockists/open market is low
market/stockists have stocks in times of need	volume of seed stocked locally is low

Question: Do stockists favor products adapted mostly for the more favorable zones, and of crops that tend to be more commercialized?	I [farmer] fear I will divert cash/voucher for other purposes
Question: Would the voucher system guarantee the farmer a minimum quantity of seed?	

Organization: Centralized or decentralized

Finally, a closing reflection on the organization of the seed-aid process. Even this small number of cases suggests that seed aid (procurement and delivery) is more effective when it is done in a decentralized manner.

- The choice of crops and varieties can be tailored more to the local environment.
- Targeting on a smaller scale is more accurate.
- A range of approaches is possible, rather than standardized ones, if seed aid is tied to the actual cause. In some cases, seed alone may be needed; in others, skill building may prove crucial; and in still others, novel approaches to crops and crop management may be vital.

The need for a greater basket of approaches may be clearer when we look at some of the effects of 10 years of seed aid, within a broader, farming-systems context in the next section.

Summary: Key points

1. Three-quarters of those interviewed (77.8%) received seed aid 1997. At GOK-managed sites, maize and beans were primarily given, with those at Baringo also receiving vegetable seeds. NGO-managed sites also distributed maize and beans, and further distributed seed of more drought-tolerant crops

(cowpeas, sorghum, millet, pigeon peas)—to promote their use. The single site at Makueni programmed in an aid component of farmer capacity building (in improved seed production).

2. Farmers generally assessed the crops and varieties that were given as appropriate. The more drought-tolerant crops were also deemed 'acceptable' as long as maize is one of the elements in the aid package. Over 85% of the maize and bean seed was sown, with relatively lower proportions of the cowpea and sorghum seed.
3. The quality of seed given was deemed exceptional: most farmers sampled do not routinely use certified seed or maize hybrids (exception in Baringo). Farmers recognize the luxury value of hybrids, but not necessarily just for direct sowing. They can exchange the packaged maize for urgently needed items (for example, food staples such as salt, sugar, and oil). Seed aid in this sense achieves a currency function.
4. All three process variables were generally deemed problematic by farmers: timing (generally late), targeting (not transparent), and quantities received (too little). The less rigorous targeting was directly related to lesser quantities received per farmer. Overall, the process variables were generally rated higher at Makueni, where a prior assistance program had been established.
5. Each of the four sites had specific built-in biases in targeting, with the possible exception of the government-managed site Machakos, where there seems to have been a blanket distribution for everyone who appeared at public meetings. Apparent biases were noted at Makueni (those who organized into work groups), Embu/Mbeere (Catholics), and Baringo (those with access to irrigated plots). There was some evidence that poorer populations also were specifically reached in Embu/Mbeere.
6. Lack of targeting transparency (i.e., 27 different—and at times conflicting—criteria cited by farmers) creates social frictions. At GOK-managed sites, all expect seed as part of a 'public good.' The fuzziness in targeting is also related to an ambiguity in the goals set for the seed-aid distribution (see point 8, below).
7. While vouchers were not given, exploration of their potential acceptability showed farmers very divided as to their usefulness and acceptability. Much depends on (a) the availability of local crops/varieties, even if purchasing power were guaranteed, and (b) the 'will power' of farmers to use the cash/voucher solely for seed stocks. Different kinds of farmers seem to prefer different options, based to a certain extent on wealth. The very poorest prefer seed aid because of their fear of diverting money *and* because maize hybrids are beyond their normal reach. Richer farmers—a good number of whom received seed aid—generally feel equally disposed to the two options: hybrids are what they normally use and they have little trouble reaching the stockist. The issues of distances to market (particularly in Makueni and among the aged) would cut across wealth categories, as would a concern that 'quality' seed (local quality seed as well as certified) just isn't available in local markets. In areas where aid organizations are experimenting with non-maize options, farmers sometimes prefer the seed aid just because the crops or varieties they desire (green grams, cowpeas, millet) may not be easily available otherwise.
8. The goals of giving are not transparent in the four cases analyzed, with four distinct goals emerging:
 - *to fill a temporary seed gap—for the farmer to have something to plant*
 - *to encourage self-help or for farmers to achieve a self-sustaining seed-production strategy*
 - *to give a gift to a political constituency—political combined with farming goals*
 - *to stimulate 'progressive' farming practices.*

None of these goals is inherently negative, although the first two probably more closely parallel goals aspired to in emergency stress situations. However, the multitude of goals, and accompanying approaches, create confusion about what seed is for and create false expectations as well as unnecessary dependencies.

9. Even the small number of cases suggests that seed aid (procurement and delivery) is more effective when decentralized:
 - *The choice of crops and varieties can be more local and tailored to the environment.*
 - *Targeting on a smaller scale is more accurate.*
 - *A range of approaches is possible, rather than standardized ones. In some cases, seed alone may be needed; in others, skill building may prove crucial; and in still others, novel approaches to crops and crop management may be vital.*

Section 4

EXTERNAL LOGIC OF SEED AID:

HAS IT SERVED TO STRENGTHEN FARMERS' SEED AND AGRICULTURAL SYSTEMS?

This section looks at the effectiveness of the aid in the context of farmers' broader agricultural-management strategies. It examines whether the seed aid given helped farmers "get back on their feet" and re-establish a sustainable mode of accessing desired seeds. To arrive at this longer-term perspective, this section reviews farmers' history of seed aid and its relative importance among the other seed-procurement strategies farmers have, during both emergency and more routine agricultural periods.

History from the perspective of seed-aid recipients

The introduction (section 1) gave a glimpse of the government view of the history of seed aid. It started on a large scale in 1992, and seed has been distributed nearly every year since then. More detail on the 1997 distribution showed that the seed aid given, mostly maize, provided between 10% and 35% of total seed sown, by district.

This section looks at the history of seed aid in Kenya from a farmer-centered perspective, with the profile of aid delivery at four specific sites. Those interviewed (in July 1998) were asked to recall the number of times and type of seed aid they had received since 1992. For each farming family, the donor of the aid, crop, variety, and dates were all recorded. However, given the relatively long time period for recall, it is likely that farmers *underestimated* the times they received aid over the previous eight years.

Table 16 indicates the number of times, since 1992, that farming families received seed aid. On average, each family has received aid slightly more than twice, with an impressive high of 10 times. In Machakos, Baringo, and Makeni, sampling of those interviewed was random within general zones where seed aid was recorded to have occurred in 1997. In the other two areas (Embu/Mbeere and Thika), the intermediary organizations contacted provided detailed lists of farmers who had supposedly received seed for the 1997 Long Rains season (although a number of the farmers on the lists claimed not to have received seed aid). The latter two samples were to loosely correlate with 'the poor.'

Table 16: Number of times farmers have received seed aid since 1992

REGION	SAMPLE	AVERAGE	MODE	HIGH	LOW
Machakos	46	1.8	2	4	0
Baringo	46	1.4	1	3	0
Makueni	33	2.2	1	5	1
Embu/Mbeere	40	3.1	4 / 3	10	1
Thika	7	3	3	5	2
OVERALL	172	2.1	2 / 1	10	0

The table indicates that most farmers, irrespective of wealth, have received seed aid more than once in the last decade. (See also the section on targeting. Officials honestly admitted that politically, it is difficult *not* to do a blanket distribution.)

Further, many of the 'poor' receive seed aid once in about every two seasons. (*Poor* is indicated in quotation marks because concerns were raised within the Church sample that the main criterion seems to have been membership in a parish.)

Several farmer quotes indicate vividly how much farmers have come to expect agencies (government and nongovernment) to provide what might be considered 'emergency' aid—but on a continued basis.⁵ Furthermore, the recurrent (rather than acute, one-off) nature of problems is also well recognized by farmers.

In Embu, farmers commented

Seed aid should be given throughout the year, whether during emergency periods or normal periods, because some farmers who have enough land can't use it because of financial problems. The most serious problem is the high price of seeds. [No. 4]

Sometimes the aid comes when farmers don't have cash to buy seeds that give good yields. [No. 18]

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. [No. 10]

In Machakos, one farmer added further

The MOA should train people to educate farmers on how to preserve seeds for planting, how to improve them instead of buying seed and waiting for aid every time. [No. 54]

An example from another region reinforces what was found within this study: farmers have become dependent on seed aid in the sense that they *expect* it to come, and have altered their seed strategies accordingly. One farmer in the Tana District, when asked what his procurement strategy would be if seed aid were not given, commented, "Oh, that would never happen." (T. Remington, CRS, personal communication, 1998).

Importance of seed aid 1997 among farmers' overall procurement strategies

Government records for the Long Rains 1997 indicate that aid seed accounted for about 10%—35% of the seed sown in the regions for which data were provided to the Office of the President (table 2). This view from the top down, however, looks quite different from that expressed from bottom-up, that is, from the view of the individual farming family. This family-centered perspective is explored below.

In the course of extended interviews, farmers listed the full range of sources from which they procured seed for the Long Rains 1997. Across the board (that is, across farmers and crops) farmers listed seven main sources for obtaining seed:

seed aid	given in emergency aid (from church, NGO, 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.

These sources are obviously among those for procuring seed of their two main crops, but to varying degrees. Maize and beans are very different in terms of seed issues. Hybrid maize in Kenya has been heavily promoted by both the government and private sector (Hassan and Karanja 1997) and, if planted according to recommendations, should be totally renewed each season. Hybrid maize can potentially be accessed by most farmers at the small local stockist shops—all they need is money. Improved varieties of beans have also been developed by research (e.g., Mwezi Moja, Mwitamania). However, they are less readily available from the formal seed sector and, as a self-pollinated crop, beans can be resown season after season (with some disease limitations), even using the new varietal materials.

Tables 17 and 18 show how farmers accessed their maize and bean seed for the Long Rains of 1997. Seed-aid maize, which was the lion's share of aid given, provided 14% of the total maize sown, while aid for beans reached 11% of the total.

The situation for sorghum and cowpea (tables 19 and 20) was slightly different, as aid agencies most often gave this crop expressly to diversify the farmers' crop profile (that is, to promote more drought-tolerant crops in areas where farmers were still concentrating resources on their cherished maize and beans). Aid seed for these minority crops, therefore, proved more significant in relation to the total sown.

Table 17: Importance of maize seed aid to farmers' overall seed-procurement strategy, Long Rains 1997 (N=91 farmers)

SEED SOURCE	KG	% OF SEED PROCURED
Seed aid	257.1	14.1
Home-saved	464.6	25.4
Local market	706.0	38.6
Stockist	277.0	15.2
Relatives	80.2	4.4
Extension	5.5	0.8
Other	27.0	1.5
TOTAL	1,827.4	100

Table 18: Importance of bean seed aid to farmers' overall seed-procurement strategy, Long Rains 1997 (N= 43 farmers)

SEED SOURCE	KG	% OF SEED PROCURED
Seed aid	109.9	11.1
Home-saved	315.0	31.9
Local market	481.0	48.6
Stockist	41.0	4.1
Relatives	38.2	3.9
Extension	4.0	0.4
Other	-	-
TOTAL	989.1	100

Table 19: Importance of sorghum seed aid to farmers' overall seed-procurement strategy, Long Rains 1997 (N=34 farmers)

SOURCE	KG	% OF SEED PROCURED
Seed aid	85.9	32.7
Home-saved	46.5	17.7
Local market	121.0	48.6
Stockist	4.0	1.5
Relatives	3.5	1.3
Extension	2.0	0.7
Other	-	-
TOTAL	262.9	99.9

Table 20: Importance of cowpea seed aid to farmers' overall seed-procurement strategy, Long Rains 1997 (N=29 farmers)

SEED SOURCE	KG	% OF SEED PROCURED
Seed aid	56.4	26.6
Home-saved	17.0	8.0
Local market	56.0	26.4
Stockist	6.0	2.8
Relatives	40.0	18.9
Extension	9.5	4.5
Other	27.0	12.7
TOTAL	211.9	99.9

These tables show that during the emergency period, farmers accessed the majority of their seed by themselves for all four crops analyzed: maize, beans, sorghum, and cowpeas.

Also clear is the central importance of local markets (*not* stockists) for accessing seed, even more than home-saved stocks. Note that the source *local markets* proved to be the most important even during a so-called ecologically stressed period.

Finally, table 21 homes in on the central question that an aid agency might ask: How many farmers relied on seed aid for 100% of the seed sown of a particular crop? Would there have been farmers who would have had *no* seed in the absence of a seed-aid intervention?

Table 21: 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)	MACHAKOS (N=35)	BARINGO (N=28)
ALL CROPS	66%	61%	14%	29%
Staple crops	3%	24%	0%	7%
versus				
More novel crops	63% millet cowpea sorghum	36% millet cowpea sorghum	14% sorghum	21% income- generating vegetables
OVERALL: 8% for staple crops; 31% for novel crops				

Table 21 suggests, at first glance, that seed aid seems to have been important for an impressive number of farmers, varying from 14% to 66% who used it for 100% of their crop at each site. However, a closer analysis, by crop, shows that only six farmers (one at Makueni and five at Embu) relied 100% on seed aid for their *key* crops—that is, those in which they themselves normally invested. For most farmers, seed aid supplied their full seed stocks of a given crop only if the crop were relatively new or lower priority, as in the case of cowpeas, sorghum, pigeon peas, millet, or the income-generating vegetables such as onions, kale, and tomatoes.

Would farmers have endured severe seed shortages had seed aid been not given? From our sample, the evidence is far from conclusive and veers towards a 'no.' However, this reflection should be tempered by the importance of aid to the Embu/Mbeere sample, which, by several parameters, was more focused on the poorer agricultural segments.

Farmers' agricultural and seed systems: What is normal (i.e., a non-emergency period)?

It is hard to judge how abnormal any situation is unless one understands how things operate in more routine times. This basic, even banal, reflection, seems to have been consistently overlooked in shaping the large majority of seed-aid interventions to date—certainly those going on in Kenya in the last 10 years. To-date, a simple linkage has been made: when harvests are slightly lower, maybe even cut in half, give farmers seed aid—immediately! There has been little or no effort to examine the resiliency of farmers' agricultural or seed systems, or to question whether physically giving farmers seed is the best among several potential strategies (alternatives including, for example, giving farmers vouchers to access seed themselves, or subsidizing local-market seed prices for a period of time). Seed is given without diagnosing what the constraint may be, or whether there is a seed constraint (aside from the fact that the harvest of a given crop may be lower than normal). This lack of diagnosis and lack of understanding of the seed system itself is particularly flagrant in a situation such as Kenya, where seed aid has been given some 10 or more out of 16 consecutive seasons.

In this section, we take a broader view and examine farmers' current 'routine' agricultural strategies: What are the priority crops? How is seed for these crops normally accessed? Some the key changes farmers perceive as hindering or enhancing seed systems over the last decade are also considered.

Priority crops

Farmers designated their priority crops at each of the four sites, using their own key criteria (tables 22 to 24). As always, maize came first across sites and then beans, despite the important differences among farmers' own agricultural conditions (some having access to irrigation, some not). This access to or lack of water is reflected more in their third choice of crop. Those without supplemental water (all but Baringo) were increasingly interested in the more drought-tolerant crops, while those belonging to irrigated schemes (Baringo) were experimenting with vegetable gardening (for sale at town and urban markets).

Table 22: Priority crop 1-farmers' assessments at each site (% of farmers)

CROP	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Maize	97	97	91	100
Beans			9	
Sorghum				
Millet		3		
Cowpea	3			
Pigeon pea				
Green gram				
Onions				
Kale/Cabbage				
Tomatoes				
Other commercial vegetables				

Table 23: Priority crop 2-farmers' assessments at each site (% of farmers)

CROP	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Maize	3	3	9	
Beans	67	55	91	79
Sorghum		3		
Millet	3	33		11
Cowpea	17	27		
Pigeon pea	7			
Green gram	3	9		
Onions				
Kale/Cabbage				
Tomatoes				4
Other commercial vegetables				
Banana				7

Table 24: Priority Crop 3: Farmer assessments at each site (% of farmers)

CROP	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Maize				
Beans	10	6		14
Sorghum	3	24	11	
Millet	10	3		14
Cowpea	57	27	26	
Pigeon pea	20		46	
Green gram		33	3	
Onions				
Kale / Cabbage			3	14
Tomato				
Other commercial vegetables			3	
Potato		3		7
Cassava			9	14
Banana		3		36
Watermelon				4
Peas				7

When these priority crops are matched against what was actually given (table 25), we see that according to the farmers' views, the crops given as aid matched to a large extent farmers' own crop priorities.

Overwhelmingly, farmers received at least one of the crops they considered most important. This issue of the 'right' crop is explored—and debated—in section 5.

Table 25: Farmers' assessments of whether seed aid given in 1997 comprised crops valued among their three top priority crops (% of farmers)

Response	Makueni (N=28)	Embu/Mbeere (N=30)	Machakos (N=33)	Baringo (N=27)
All crops distributed were priority*	27	52	77	78
50% of crops distributed (or 1 out of 2) were among the three top priority	57	45	9	7
None	17	3	14	15

Description of farmers' routine seed-procurement strategies

Farmers also offered insights into their normal strategies for accessing seed for their key crops of maize and beans. Their sources were described, along with the frequency seed was procured off-farm and the relative amounts procured from off-farm sources. Getting both frequency and relative amounts is important for understanding farmers' opportunities and constraints. A farmer who gets most of her bean seed off-farm every season may be financially stressed, eating her full harvest before the next sowing. This is very different from a farmer who may seek a handful of seeds every season to test new varieties.

1. Maize

Farmers' routine strategies for procuring maize are summarized in tables 26 through 28. Except for the case of Baringo, nearly all farmers regularly use home-saved maize seed (kernels harvested the season before) and also regularly use the local market to top-off supplies. Use of stockist seed (that is, the use of improved varieties and of certified seed) is near universal only in the Baringo sample, although between one-quarter and a third of farmers in Machakos and Embu/Mbeere claim to use it 'occasionally.' Of farmers sampled in Baringo, generally 100% use a stockist for acquiring seed; 89% use a stockist every season; and about 78% use a stockist to renew all of their seed. This is a very different scenario from those sampled in Makueni. There, very few farmers ever access maize seed from a stockist (6%), relatively few get maize off-farm every season (20%), and when they do, it is not usually 100% of their needs (only 13.3% of farmers get 100% of their seed off-farm).

Table 26: Maize—farmers' normal procurement sources for seed (% of farmers citing source)

Source	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Home	97	100	100	36
Local Market	87	61	91	-
Stockist	6	25	31	100
Relatives	13	12	17	-

Note: Numbers do not tally to 100% because a single farming family may use multiple sources during the same season for getting different proportions of their seed. Further, in some seasons, certain sources are more important than others.

Table 27: Frequency (farmers' estimates) of accessing maize seed off-farm (% of farmers at site)

Frequency	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
Every season	20	9	20	89
One in 2 or 3 seasons	60	67	66	11
Less frequently	20	18	9	-
Only in drought	-	3	6	-
Never	-	3	-	-

Table 28: Farmers' estimates of percent of maize seed acquired off farm when an off-farm source is accessed

Percent of seed procured off-farm	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
100	13.3	38	20.0	77.8
70-99	10.0	-	17.1	3.7
50-69	40.0	38	34.3	11.1
20-49	30.0	22	22.9	7.4
Under 20	6.7	3	5.7	-

Qualitative insights from the different sites further differentiate among farmers' concerns and constraints in reference to the maize crop. Again, we use Makueni and Baringo as examples of the more extreme.

In Makueni, farmers highlight their very vulnerable farming conditions. They describe frequent droughts in the area, with routinely poor maize harvests. Farmers use home-saved seed except when it is lost to drought, and then they buy from the local market. Even local market seed is deemed expensive: farmers rarely use a stockist. Stockist stores are few and far between in Makueni, and many farmers feel the improved varieties on offer are not adapted to their local growing conditions. Very tellingly, two out of the 30 farmers interviewed listed "emergency aid maize seed" among their *routine* sources of seed procurement.⁶

In Makueni, the message was the same, again and again:

When rains are low, maize is lost—we buy seed from local market. [No. 130]

but

We prefer home-saved seeds, so we can save money for other purposes [school fees, food]. The quality of seeds bought is unknown. [No. 136]

In Baringo, the scenario described for acquiring maize is quite different. Clearly, those with access to irrigation want hybrids and certified seed—and are prepared to pay for it.

Farmers comment:

Only poor people use home-saved seeds. [No. 113]

Seed aid saves us money. It reduces the costs of our having to buy from the stockist. [No. 146]

Further, in the Baringo sample, the agricultural jargon common to both extension agents and 'model farmers' was repeated fairly frequently:

My farming has improved and through seed aid I have been encouraged how to do farming properly—I know which plants to use, how many seeds to put per hole, and the correct time to sow. [No. 112].

These very different contexts—irrigated/progressive practices in Baringo and rainfed/local routines in Makueni—are not sufficiently reflected in government seed strategies in these regions. They all get maize, with modifications only in the choice of variety.

2. Beans

The case of beans is different from maize. As beans are self-pollinated, farmers potentially have more control over their seed supplies: they can resow a small portion of what they harvest. Tables 29, 30, and 31 summarize farmers' strategies for procuring bean seed. Across sites, home-saved stocks are a central source of seed. However, local markets appear as an equally used source. Given that bean seed can be easily selected out from the previous harvest, it is surprising how many farmers get bean seed off-farm every season or every other season (about 30% across the sites)—and how much—most farmers (70% plus) get more than half their seed off-farm on a regular basis. Complaints were rampant about the low quality of local market seed, so the varieties and seed they get off-farm are certainly *not* better than what they harvest themselves. This unusually high amount of bean seed accessed off-farm is an index of poverty (*not* of progressive farmers improving their seed). Note that in the Machakos sample, some farmers routinely listed emergency seed aid as a source of beans, while others highlighted their use of food stores

for bean seed. Note also that in the descriptions for both maize and beans, farmers felt they could rarely get seed from relatives.

Table 29: 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	

Table 30: Frequency (farmers' estimates) of accessing bean seed off-farm (% of farmers by site)

Frequency	Makueni (N=20)	Embu/Mbeere (N=22)	Machakos (N=35)	Baringo (N=22)
Every Season	40	22	37	27
One in 2 or 3 seasons	45	39	51	50
Less frequently	15	39	11	18
Only in drought	-	-	-	-
Never	-	-	-	5

Table 31: Bean: farmers' estimates of percent of bean seed acquired off-farm during 'normal' season (when off-farm acquisition takes place)

Percent of seed procured off-farm	Makueni (N=20)	Embu/Mbeere (N=18)	Machakos (N=35)	Baringo (N=22)
100	40	39	23	9
70-99	20	-	17	23
50-69	15	17	26	45
20-49	5	27	29	14
under 20	10	17	6	-
0	-	-	-	9

For both maize and beans, the data shown above contradict what is often taken as a truism when describing farmer seed systems: that 'normal' farmers use about 80% of their seed from their own stocks and that accessing off-farm seed sources is 'abnormal' (Cooper 1993). The Kenyan material shows that small farmers routinely rely on local markets for seed. Similar in-depth seed studies in three other African countries (Rwanda, Burundi, and the Democratic Republic of the Congo) also show that smallholder farmers rely heavily on markets for bean seed, a self-pollinated crop (Sperling et al. 1996). Perhaps in some 'good ole days' farmers were self-sufficient in their inputs, but certainly not now. This observation has important implications for action: ensuring that local markets can deliver good-quality seed may be as important as increasing the farmers' ability to produce more seed inputs of their own.

Assessment/Reflection: Farmers' routine procurement strategies

It is one thing for an outsider to comment on Kenyan farmers' high use of local markets (and a commercially oriented assessor might scorn their lack of use of stockists). However, more relevant is how farmers themselves reflect on the adequacy of their 'routine' seed-procurement strategies. How do they see the trends of the last decade, and what do farmers themselves hope for?

In the case of maize, farmers overwhelmingly expressed unhappiness with the way they get maize seed—again, with the notable exception of Baringo where the 'progressive' sample accessed seed from stockists (table 32). For the large majority, some maize seed is home-saved and some is bought from local markets; relatives give little support. Farmers cannot afford certified seed, find the prices exorbitant, and, as in many seed studies (e.g., David 1996; Sperling et al. 1996), complain about the local market—the right varieties not available, seed poor quality, merchants cheating on quantity, and the distance. This widespread dissatisfaction seems serious for a crop that forms the core of their agriculture.

Table 32: Farmers satisfied with their routine maize seed-procurement strategy? (% of farmers)

RESPONSE	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
YES	30	39	17	64
NO	70	61	83	36

There have been vigorous efforts to promote the use of improved maize varieties and practices among all farmers—to achieve what is sometimes called 'Africa's emerging maize revolution' (Byerlee and Eicher 1997). Yet, a widespread analysis from a nationwide Kenyan survey in 1992-93 showed benefits accruing mostly to larger-scale farmers and farmers in higher potential zones, rather than smallholders (Hassan and Karanja 1997): "farmers' major reasons for not using improved seed were that an appropriate variety was lacking, seed was expensive, or they were unaware of improved seed. The reasons limiting farmers' adoption of fertilizer included its expense and unavailability" (Hassan et al. *forthcoming*, as cited in Hassan and Karanja 1997: p. 84).

Do farmers in our sample see the trend as improving? Apparently not. Some of the more detailed comments, using an example from Machakos, suggest just the opposite: "yields are decreasing, prices are going high, and former exchange networks no longer function as well" (table 33). Should this rhetoric just be attributed to 'old people complaining about better times'? Within our sample, discontent is simply too widespread to be written off so easily.

Table 33: Changes in farmers' maize seed-procurement strategy in the last 10 years?

RESPONSE	Makueni (N=30)	Embu/Mbeere (N=33)	Machakos (N=35)	Baringo (N=28)
YES	15	36	26	64
NO	85	64	74	36

Table 34: Machakos—Changes in farmers' maize seed-procurement strategy in the last 10 years? (N=35 farmers)

RESPONSE	COMMENTS
YES	<p>26%</p> <p>For Worse: 20%</p> <p>Yields going down; farm size decreasing</p> <p>Stocks used to last 3 months, now only one</p> <p>Used to be able to exchange seed, now have to buy</p> <p>No longer buy certified seed, has become too expensive</p> <p>For Better: 6%</p> <p>Can get seed in smaller packets</p> <p>Change in varieties: now have Katumani and Makueni</p>
NO	<p>74%</p> <p>Most complain of cycle: poor harvest, not enough seed, eat some, buy off-farm, market seed poor quality, certified seed much too expensive</p>

For bean-seed acquisition, farmers' sentiments are strong and clear across sites (table 35). The large majority find themselves heavily tied to the local market—spending money but not sure of the quality they are receiving. Some in Machakos even complain of *not* planting land (the alleged scarce production factor for smallholders) because of lack of seed. (A kilogram of bean seed can easily cover a 10m by 10m plot). Because it is self-pollinated, farmers generally regard bean seed as something they shouldn't have to buy, using the money for school, medicine, and food instead. Overall, the 'average farmer' wants self-sufficiency in bean seed. 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.

Table 35: Farmers satisfied with their routine bean seed-procurement strategy? (% of farmers)

RESPONSE	Makueni (N=20)	Embu/Mbeere (N=18)	Machakos (N=35)	Baringo (N=22)
YES	25	33	6	36
NO	75	67	94	64

Have bean-procurement strategies changed over the last 10 years? Farmers' assessments are even more damning for beans than for maize (table 36). Again, taking an example from Machakos, there are concrete reasons for farmers' overall discontent. The only positive move in 10 or so years seems to have been the availability of one or two new varieties.

Table 36: Changes in farmers' bean seed-procurement strategy in last 10 years?

RESPONSE	Makueni (N=20)	Embu/Mbeere (N=18)	Machakos (N=35)	Baringo (N=22)
YES	5	27	6	14
NO	95	73	94	86

Table 37: Machakos—Changes in farmers' bean seed-procurement strategy in the last 10 years? (N=35 farmers)

RESPONSE	COMMENTS
YES	<p>23%</p> <p>For Worse: 20%</p> <p>Land is, very visibly, deteriorating</p> <p>Land available now much less (land fragmentation)</p> <p>Used to be able to exchange seed, now have to buy</p> <p>Used to save seeds, now have to buy</p> <p>Used to be able to buy seed, now cannot afford it</p> <p>For Better: 3%</p> <p>Some new varieties</p> <p>Change in varieties</p>
NO	<p>77%</p> <p>Land has degenerated. They are now forced to buy bean seed. Rains are unreliable; they get low harvests, have high storage losses, and eat all the seed. Cycle starts again.</p>

Taking a broad sweep, table 38 summarizes all the key trends farmers cited in terms of seed acquisition over the last 10 years, across crops and sites. Although simplified, the table sends a powerful message. The Kenya smallholder farming systems are very stretched. Giving seed here and there does little but apply a band-aid (and maybe ineffectively) to a much bigger problem.

Table 38: Farmer seed-strategy changes—General reflections, last 10 years (N=134)

NEGATIVE CHANGES	POSITIVE CHANGES
<ul style="list-style-type: none"> • land fragmentation/reduced farm size 	<ul style="list-style-type: none"> • some new varieties
<ul style="list-style-type: none"> • no longer produce enough home seed 	<ul style="list-style-type: none"> • can buy seed in smaller packets
<ul style="list-style-type: none"> • deterioration of fertility 	
<ul style="list-style-type: none"> • seed prices going up 	<ul style="list-style-type: none"> • now we have churches and international organizations giving seed aid
<ul style="list-style-type: none"> • no longer can exchange seed with neighbors 	<ul style="list-style-type: none"> • farmers learn how to produce better seed [German Agro-Action]

Discussion: External logic of seed aid

This section has documented the relative unimportance of seed aid in farmers' overall seed-procurement strategies during an emergency period. Perhaps the quantities of seed aid given were too little to make a dent (as farmers complained), or perhaps farmers really needed little outside help for seed, knowing how and where to access it and with limited financial means were able to do so. In both cases, a very expensive seed-aid operation proved not to be a critical element in farmers' accessing seed for 1997.

The data also confront the myth that normal smallholder farmers save most of their seed and only turn to outside sources when very stressed. Local markets have long been equally important in topping off supplies and adding new varieties—for the very poor who have to restock each season, as well (Sperling and Loevinsohn 1993). Local markets, themselves, need to become a more central focus of development efforts, to ensure that a diversity of varieties, locally adapted varieties and crops, and quality seed can be purchased locally. This implies increased work on local-level seed production, distribution, and marketing. It also implies that research must take a much more aggressive role in working with farmers to develop locally adapted varieties that combine production gains with desired quality traits. These issues are explored again in section 5.

Finally, this external perspective on seed aid has documented the general vulnerability of farmers' seed systems and overall agricultural systems. Farmers in both acute stress (drought) and routine times are heavily tied to purchasing large amounts of seed, even the self-pollinated types, and mainly choose to do so at local markets. There have been few positive developments to support their seed systems over the last 10—years—just a new variety here and there.

There is no concrete evidence that seed aid, *per se*, is strengthening farmer systems. Those who have received it once are not necessarily less likely to receive it again. The amounts given were not significant in the context of farmers' overall seed-procurement strategies. Furthermore, the main crop given—hybrid maize—does not ensure that farmers can become less dependent on outside sources: it performs only in favorable conditions and has a built-in deterioration factor. At best, the seed aid has served as a temporary stop-gap measure for the very needy. Considering that it treats but a symptom, and maybe not in the most effective way, seed aid (seed-and-tools), as being currently delivered, seems to be a rather costly intervention. These issues are pursued in section 5.

Summary: Key Points

1. Since 1992, on average, each farming family has received seed aid twice, with a high of 10 times. Thus, most farmers, irrespective of wealth, have received seed aid more than once in the last decade. Those in the 'church sample' (Embu/Mbeere), who correlated more closely with poorer segments of the population, received seed aid about once in every two seasons. Farmer comments suggest that many have come to expect 'emergency' aid on a continued basis.
2. Seed aid of maize, which was the lion's share of aid given, provided 14% of the total maize sown in Long Rains 1997, while for beans, aid seed represented 11% of the total sown. The situation for sorghum and cowpea was slightly different, as aid agencies most often gave these crop expressly to diversify farmers' crop profiles in more drought-prone areas. Aid seed 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 by themselves for all four crops analyzed: maize, beans, sorghum, and cowpeas. Across crops, a large portion of seed was sourced from local markets, not stockists, even in ecologically stressed areas.
3. The research assessed the portion of farmers relying on seed aid for 100% of their seed sown during the Long Rains 1997. Overall figures varied from 14% to 66% of farmers at each site. However, a closer analysis by crop shows that only six farmers (in total across sites) relied 100% on seed aid for

the key crops in which they themselves normally invest. For most farmers, seed aid supplied their full seed stocks of a single crop only if the crop were relatively new or lower priority—as in the cases of cowpea, sorghum, pigeon pea, and millet—or an income-generating vegetable such as onion, kale, and tomato.

[The case study explored farmers' routine crop and seed-procurement strategies so assess how 'abnormal' their practices were during the designated emergency. The following summary points refer to analysis of more normal periods. To-date, seed aid has been given without diagnosing what the constraint may be. There has also been little effort to examine the resiliency of farmers' agricultural or seed systems, or to question whether physically giving farmers the seed is the best among several potential strategies.]

4. Across sites, farmers primarily assessed their top two priority crops as maize and beans, with some of the more drought-tolerant crops cited in third place at nonirrigated sites and the income-generating vegetables cited where water supplies were more reliable. The matching of farmers' priorities with what they received as aid showed, overwhelmingly, that farmers received at least one of the crops they consider most important. [The issue of the 'right crop' during normal versus emergency periods is debated in section 5.]
5. Farmers used some seven potential channels for accessing seed. For maize, nearly all farmers regularly use home-saved maize seed as their main source and, also, regularly use the local market to top-off supplies. Use of stockist seed, that is, use of improved varieties and of 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 predominance of local maize seed perseveres in these drought-stricken areas in a context of very vigorous and prolonged government efforts to promote hybrid and certified material.
6. For beans, across sites, farmers use home-saved stocks as their central source for seed. However, local markets appear as an equally used source. Given that bean seed can easily be selected out from the previous harvest because 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) and how much they get off-farm (at least 70% of stocks). Thus, most farmers get more than half their bean seed off farm on a regular basis.
7. For both maize and beans, the Kenyan data contradict what is often taken as a truism when describing farmer seed systems in Africa: that is, that 'normal' farmers use about 80% of their seed from their own stocks, and that accessing off-farm is 'abnormal.' This Kenyan study shows that small farmers routinely rely on local markets for a significant portion of their seed.
8. 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 cannot afford certified seed (and find the prices exorbitant), and complain about the local market: the right varieties not available, seed quality poor, merchants cheating on quantity, and distances. This widespread dissatisfaction seems relatively serious for a crop that forms the core of their agriculture.
9. 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 without being 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—using the money for school, medicine, and food instead. 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 in these drought-prone areas.

10. Have seed trends improved for maize and beans over the last decade? Apparently not; just the opposite. 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 emergency of seed aid, the packaging of varieties in smaller packets—do little to counteract strong negative forces.

11. There is no concrete evidence that seed aid, per se, is strengthening farmers' systems. Those who have received it once are not necessarily less likely to receive it again. Amounts given were not significant in the context of farmers' overall seed-procurement strategies. Furthermore, the main crop given, hybrid maize, does not ensure that farmers in these areas will become less dependent on outside sources, as hybrids tend to perform well only in better conditions and have a built-in deterioration factor. Considering that it treats but a symptom, and perhaps not in the most effective way, seed aid (seed-and-tools), as currently delivered, seems to be a rather costly intervention.

Section 5

CHARACTERIZING SEED-SYSTEM CONSTRAINTS AND OPPORTUNITIES: THE KENYA CASE

The 'external' analysis of the farmers' seed situation in Kenya (section 4) raises a number of fundamental questions about the type of problem seed aid is and was supposed to alleviate. Seed-and-tools programs, that is, the delivering of quantities of seed and basic tools on a one-time basis (the kind of intervention that is being practiced in Kenya), are designed to help farmers out of temporary and well-defined *acute stress*. Seed-and-tools are given in a context where a series of assumptions are made, whether these are consciously articulated or not:

- that farming systems have suffered an acute jolt and farmers have lost vital seed
- that a discrete injection of seed will boost farmers' means to plant the seed given, with labor, inputs, and the security adequate for planting and harvesting
- that the one-time provision of seed will help farmers re-establish an independent means of producing and accessing their own seed
- that seed will be sufficiently appropriate to fit in (adapt) and maybe even strengthen farmers' agricultural systems (help them to evolve in positive ways).

The early rationale for giving seed aid, rather than only food aid, was specifically to help farmers regain their means of production and to set them off in independent ways. However, what is happening in Kenya is that these one-time 'push to self-sufficiency interventions' are being repeated and repeated. Has the problem or constraint been adequately diagnosed? Have the appropriate support activities been well defined? Have the support activities been designed to link to the specific problems or constraints at hand?

The problem: Characterizing the constraints in Kenyan farmer seed systems—the broad view

When this study was initiated, 'the problem' was presented as an acute one: Kenyan farmers suffered drought in the season prior to 1997 and needed critical seed to sow the next time rains fell. The solution was given as seed, and the study 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, were they given in an equitable manner (see TOR, Annex 1). The goal was to make seed-and-tools interventions more effective, more on the mark.

However, as the work unfolded, using both government documents and perspectives (top-down overviews) and drawing on valuable farmer-based data and insights (bottom up), it became clear that the drought situation was not a one-off affair. It 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 operated well. However, with sharp drops in rainfall, like that 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*. There are probably a range of reasons why these repeated acute (well-defined and delineated) stresses are occurring, some of which are meteorological. (Whether there has been a significant decline in rainfall on a longer-term basis in Kenya is debatable, with a discussion of possible climate change being outside the scope of this report.)

For many Kenyan farmers within the sample, however, the seed stresses they described 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.

A first attempt to conceptualize these different situations appears below (table 39). The first two columns of the table are fairly self-evident, and distinguish acute from repeated acute and from chronic distress situations, using agroecological stresses to differentiate among the three types. Severe drought once is different from severe drought every 10 years (repeated acute) and is different again from farming in an extremely dry area on a constant basis (chronic). The second two columns start to indicate, by building a theoretical framework, that chronic, acute, and repeated acute situations affecting seed systems may be spurred by events other than agroecological ones. Disasters and/or constraints can be economically or politically induced, and a small number of variables that constrain seed systems may be directly seed and/or variety related.

Table 39: Seed-stress situations: a general overview

SEED-SYSTEM STRESS	AGROECOLOGICAL STRESS	ECONOMIC/POLITICAL	SEED PROBLEM <i>PER SE</i>
Chronic	gradual dryness semi-arid	poverty-limited access to resources	poor-quality seed produced in region/few adapted varieties available
[repeated acute]	repeated droughts		
Acute	One-off: drought, flood	civil disruption/harvest loss one season	

Using this framework as a basis, we have started to plot the information emerging from this Kenyan case study. Table 40 suggests that the agroecological stresses are, perhaps, but one part of the full constraining picture. In this first attempt to grasp the whole, economic and political constraints certainly leap forward as a major farmer-articulated problem. Further, the table suggests that focusing on seed and variety issues, *per se*, can be very ineffective in dealing with the real bottlenecks in many seed-system situations. Similarly, solving the physical seed issue may not help seed systems to function more effectively for any length of time. Much depends on what the problem(s) is.⁷

In building from this initial framework, we start to address two central issues for seed-system support interventions. The first directly addresses the seed and variety issue: which crops/varieties, when? The second asks, more broadly, what might be the appropriate range of interventions needed to bolster Kenyan farmers' seed systems?

Table 40: Seed-system stress—Indicators drawing from farmers' insights

SEED-SYSTEM STRESS	AGROECOLOGICAL	ECONOMIC/POLITICAL	SEED PROBLEM <i>PER SE</i>
Chronic	<p>Gradual drought/dryness</p> <p>Makueni: Unreliable rainfall and pests lead to poor harvests</p>	<p>Poverty—access</p> <p>Embu: Prices have sky-rocketed in the last 10 years; that is why he uses home-saved seed, even though it doesn't yield much</p> <p>Machakos: Not enough money to buy adequate seed; land left unused; too little harvest, not enough money</p> <p><i>versus</i></p> <p>Embu: Before she used to save seeds from her land; now due to fragmentation, land and production is small, so she has to buy from market every season. But she can: "The market doesn't fail me."</p> <p>Economic and seed problems: Doesn't harvest enough to feed family; eats seed; only poor-quality seed at market</p>	<p>Region produces poor-quality seed/ few adapted varieties</p> <p>Adapted varieties not available at market (seed from higher potential regions)</p> <p>Market seed is of poor quality</p> <p>Markets located too far (10–20 km)</p> <p>Serious storage losses (weevils)</p>
[Repeated acute]	Repeated droughts	<p>Access/drought:</p> <p>Embu: she buys seeds when there is drought—but at that time seeds quite expensive, so she buys less than she needs</p> <p>Makueni: Rains fail; but even when rains come, not enough money to buy seed</p>	Stockist or seed company doesn't always have good-quality seeds
Acute	<p>One-time: drought, flood</p> <p>Machakos: farmer received seed aid once in 1997 drought; was able to preserve seed for harvest; has enough for full planting</p>	Political crisis, disruption	

Linking seed stress type to right crops/varieties during crisis

Right crops in an emergency

What exactly does 'right' crops mean? Are the priority crops for normal periods also necessarily the key crops to be given during an emergency situation, which, by definition, is characterized by some kind of stress?

At a minimum, insights garnered from Kenyan farmers suggest that three categories of factors need to be addressed when choosing crops and varieties for emergency interventions. Crops/varieties should be:

- adapted to farmers' bio-physical environment
- adapted to farmers' preferences
- adapted to farmers' management conditions.

Maybe a fourth would also be appropriate also—crops/varieties should be:

- those that facilitate risk-aversion.

Would hybrid maize, the core of government-sponsored aid (with some open-pollinated varieties and composites) hold up well when compared against such categories?

Certainly one criterion that is almost universally met in the GOK seed-aid strategy is adaptation to farmers' preferences. Farmers like these highly valued varieties (and the certified-seed component)—even when they don't sow them—as hybrids have a high exchange value. In terms of bio-physical adaptation, hybrids are clearly not adapted to the poorest of farming conditions. Farmers' comments, already cited, highlight this. One example follows:

Embu: "The maize varieties from seed relief and from the stockist are less adapted to the environment than the local variety." [No. 20]

Equally evident is that the hybrids are also not adapted to many of the farmers' management conditions. A good number said they need fertilizer with the aid, as they simply cannot buy it themselves. Another comment:

Machakos: "Seed relief should be complemented with fertilizers so that the seed given as aid isn't wasted by some poor farmers who can't afford fertilizers to get a good yield." [No. 55]

Some farmers even expressed the need to learn how to cultivate the varieties given as aid:

Embu: "Seed aid should be accompanied by technical advice on spacing, fertilizers, and other practices. There are instructions on the package, but they are in English." [No. 1]

Summing up the assessment of hybrid maize against a 'right crop' emergency choice: most farmers interviewed, in four different sites, did not routinely access hybrid maize seed from stockists, did not have the management expertise, and may not even have had the appropriate bio-physical environment to nurture the 'aid' varieties. Suboptimal environments and limited knowledge do not tally up to promoting risk-aversion during a stress period. Further, the in-built deterioration factor for hybrids does not necessarily promote self-reliance in the longer-term for those farmers who cannot afford to renew their stocks on an annual basis.

The Kenya findings on the urgent need to define aid that is sensitive to farmers' full planting conditions are not necessarily unique. Simply put, the overriding bias for hybrids—bred through years and regions for more favorable environments—makes the situation somewhat extreme in ignoring basic emergency

principles. A recent FAO-sponsored workshop on Restoring Farmers' Seed Systems in Disaster Situations (FAO 1999) also reiterated the need for highly tailored types of seed aid. There, the term adopted was "variety-sensitive aid," encompassing the idea of both adapted and farmer-acceptable varieties. It was further suggested that the range of varieties on offer should be diverse enough to meet farmers' critical needs (e.g., varieties for different foods, different planting periods) (Sperling 1999).

Tailoring crops/varieties to type of crisis

Logically, additional criteria could be tailored to the notion of 'right crop or variety,' depending on the stress. To encourage reflection, several examples are given below, which link directly to the 'seed-stress framework' introduced above.

- If the **stress has been acute** and farmers are at a significant loss for planting material and food, crops that are **quicker maturing** would seem to be the more logical. This situation can be illustrated in an example from the 1994 Rwanda war/genocide. Farmers lost almost half of their beans in the field when the conflict escalated at harvest time 1994. As immediate aid, they strongly preferred the bush type of bean that matures in about three months, rather than the much higher-yielding climbing-bean type, which may take four to five months. Both bush and climbing beans are priority crops for Rwandan farmers in normal times (and are seen as highly complementary in the same farming system), but bush beans were deemed more crucial in the first stages of emergency-recovery. So **sequencing of crops** is key if one assumes that the acute crisis will end, with more normal planting conditions being re-established.
- If the **stress has been more chronic (or even 'repeated acute')**, crops that **perform better during the specific stress conditions** might be more appropriate. Drought in Kenya seems to be occurring more frequently and seems to be more widespread: seed distributions for every season since 1992 show public awareness of this trend. The choice of seed-aid crops in NGO, but not government, distributions are starting to reflect practical knowledge of this trend. Crops like sorghum and green gram may prove more tolerant to drought stress than hybrid maize in select locales.
- If the **stress is chronic**, then **more capacity-building** crop choices may be appropriate. By this, we suggest that some crops can be more easily managed by farmers and more easily sustained over seasons. For instance, farmers who are chronically short of their own home-saved seed and are chronically short of cash to top-off stocks with market purchases might be better off with open-pollinated or vegetatively propagated crops. The latter can be replanted without external resources and would be preferable to fertilizer-responsive/-demanding hybrid maize or commercial vegetable seed that requires special care or inputs. Chronic stress also demands a more holistic seed-system approach, beyond issues of seed and variety (see "linking types of non-seed-aid interventions," below).

Other examples can be developed, and a more comprehensive framework is needed for linking type of stress with the appropriate notion of the 'right crop.' Simply put, the right crop for an emergency situation may not be the most appropriate for longer-term recovery. The 'right crop/variety' should be chosen in relation to the type of stress encountered. As base criteria, all 'right crops' have to be adapted (bio-physically, socially, and in terms of management practices) and have to be acceptable to farmers. Then variables such as crop maturity, and ability to push farmers on the path to self-sustainability, might be factored in as key elements.

Linking type of seed stress to non-seed-aid interventions to support seed systems

A range of current interventions in seed-system support in East Africa aim to strengthen farmer seed systems in the longer term. Their aims include delivering more locally adapted varieties, ensuring that even

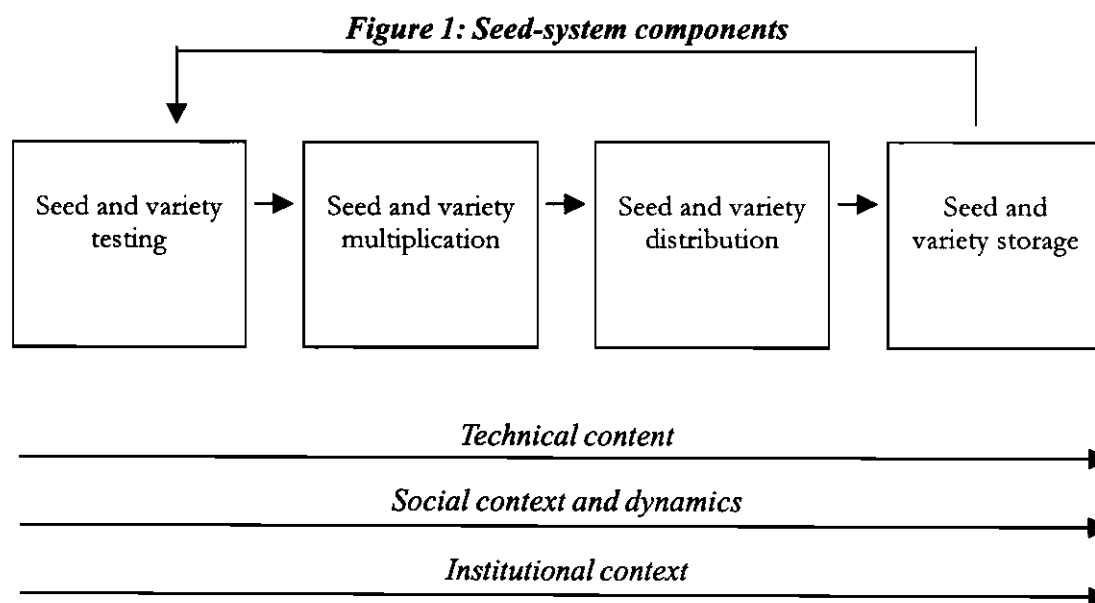
the poorest farmers can get new materials, improving the quality of farmer seed, and even helping farmers earn money from seed production operations. Annex 7 (prepared by S. David) summarizes over a dozen of these programs. They illustrate that a body of work is emerging to help address some of the more chronic constraints to seed-system health.

However, a good deal of the challenge to strengthening the systems by which farmers access seed lies in a more refined diagnosis of where the constraints and opportunities lie. Analysis of seed systems—farmer, formal, and those that aim to integrate the two—is a relatively new field. Prior to a decade ago, development work focused almost exclusively on supporting the institutionalized or formal seed sector, as this was the supposed vehicle through which farmers would receive modern varieties emerging from the formal research system. In Africa, at least, seed-system experts now estimate that such institutional channels may supply farmers with, at most, 5% of their seed, the obvious exception being maize in areas where hybrids have attained wide use, such as the Southern African Region and the higher-potential areas of Kenya and other Eastern African countries (personal communication, see the companion volume to this report).

This section ends by making the first steps to understanding what the full components of a seed system might be and how they need to be linked. The companion volume starts to lay out a methodology for diagnosing the strengths and weaknesses of the various seed-system components. More-targeted diagnosis should directly lead to more-targeted interventions, with longer-lasting positive impacts.

Moving toward characterizing stresses in seed systems: A more refined view

A seed specialist, someone who focuses on producing and distributing seed as a physical input, might feel comfortable with viewing the building blocks of a 'seed system' as four basic units: testing the material, multiplying it to ensure availability, distributing it to ensure access, and then possible storage. At each of these stages, both varietal issues (which genetic materials?) as well as seed issues (quality, quantity) are considered. These four basic blocks appear in a linear fashion in figure 1, although, of course, the end feeds into the beginning and so the cycle re-starts.

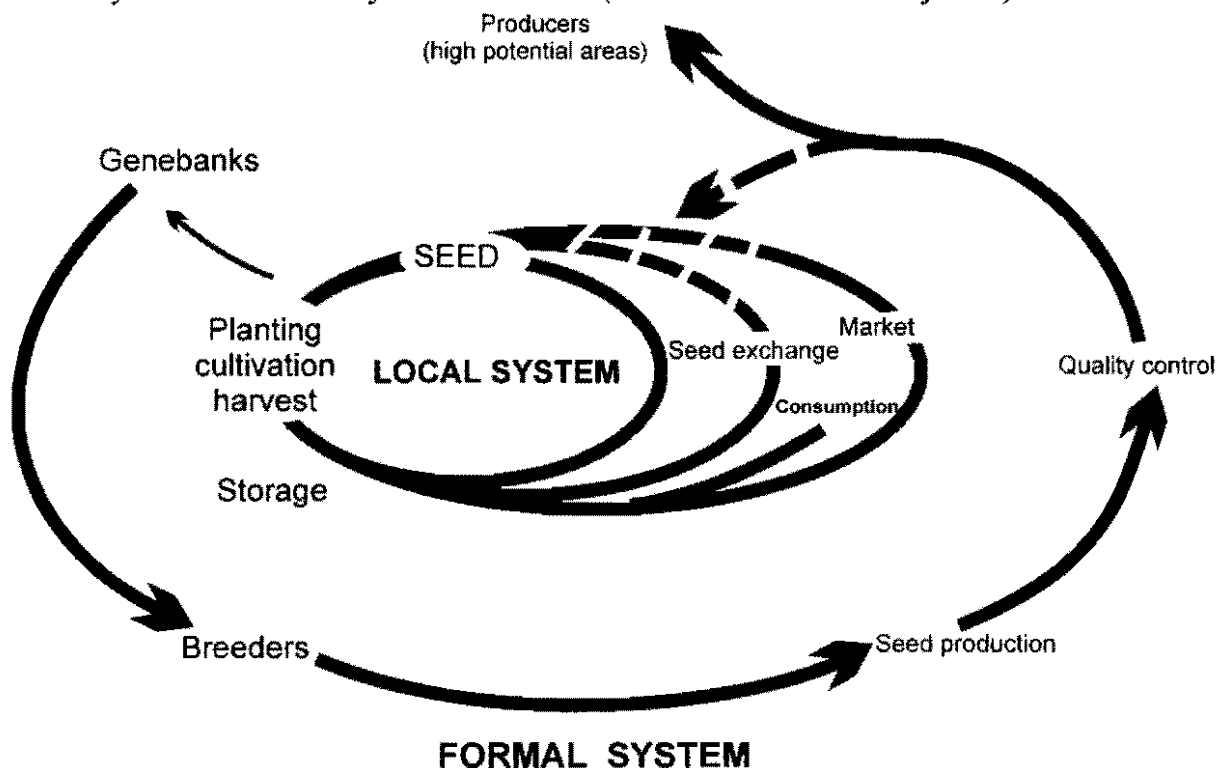


A person with more of a seed-systems perspective would add a series of filtering lenses, so as to make these blocks more realistic or closer to what actually happens. First, each of the blocks obviously has technical content: e.g., what level of genetic purity; how much multiplied? Equally, each block has a strong social content or set of social dynamics: which varieties are preferred by different farmers; how will the multiplication be organized so people will work together; how can the channels be made user-friendly so that all have access? In addition to the technical analysis and the analysis of social dynamics, one might even add a lens of "institutional analysis," since the kind of technical and social strategies are intimately tied to the institutions (whether formal or local) through which one works (figure 1).

The situation is complicated further by the increasing evidence that farmers use a variety of seed systems for different crops and for different purposes. For instance, the same farmer might get cassava cuttings from her neighbor in exchange for labor, buy her beans from one of the local open markets, and purchase her maize from a stockist in a specialized government store. And from time to time, these different systems intersect; for example, maize bought from the stockist is exchanged with the neighbor and sown for several seasons, thus affecting its quality. Figure 2 (prepared for different purposes by Almekinders and DeBoef (2000) starts to indicate the complex relationships between farmer and formal systems: sometimes linking, sometimes not.

The point in setting up these conceptual diagrams is because they help serve as a grounded base for diagnosing the strengths and weaknesses of different seed-system components that might need strengthening in an emergency situation and beyond. All might be well with the testing and multiplication blocks, but the main bottlenecks in a crisis period might have to do with the distribution channels. Seed is available in theory, but farmers may be afraid to go to public places (because of war) or may just not have the means to buy from the market (they have lost assets during the crisis). Neither of these problems is most effectively solved by giving seed. In the first instance, the seed intervention might focus on ensuring security; in the other, vouchers or credit might be considered.

Figure 2: The local system of farmers' seed supply and the formal system—two parallel functioning systems with relatively little interaction (Almekinders and DeBoef 2000)



The issue of seed-system diagnosis, developing indicators of seed-system health, and linking specific problems with specific solutions forms the core interest of the complementary volume to this report. Such a volume was not anticipated at the beginning of the Kenyan seed study, mainly because the TOR inadequately anticipated the fundamental Kenyan seed-system needs.

Discussion: Characterizing seed-system constraints and opportunities—the Kenya case

In a sense, the end of this report is really the beginning. The key to improving the series of crisis seed situations in Kenya lies in more accurately diagnosing the underlying problem in seed-system functioning. Continuing to deliver seed-and-tools may be analogous to putting a band-aid on a gushing wound.

It is clear that many farmers have chronic problems producing and accessing seed. It also holds true that those with 'just' acute seed stresses are probably not being best served by some of the current seed-aid delivery practices. (Practices may be technically ill-informed, and they are certainly creating counterproductive dependencies.) The reform of seed-system support in Kenya might best be articulated by a series of simple, yet challenging, steps that form the core of future action:

1. Accurately diagnose the seed-system problem (or cluster of problems for different populations).
2. Define precise and transparent goals of seed-aid/seed-system capacity building.
3. Build in flexibility to be able to act in site-specific manner.
4. Always think longer-term. From the discrete notion of seed aid, we need to move to a focus on how to support the current system and how to build increased capacity to help seed systems function by themselves.

Summary: Key points

1. The external perspective on seed aid has documented the general vulnerability of farmers' seed systems and overall agricultural systems.
2. For some Kenyan farmers, including those in the semi-arid areas studied in this report, 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 operated well. However, with sharp drops in rainfall, like that in 1991—92 and 1996, they have required help from the outside to get back to where they were. These farmers have been experiencing *repeated acute stress*.
3. For many Kenyan farmers within the sample, the seed stresses they describe are neither acute nor repeated acute—they are experienced 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 the ability of farmers 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.
4. This section sets out a framework for examining acute, repeated acute, and chronic stresses, cross-cutting these seed-system disaster types with root causes: agroecological, political/economic, and seed-system issues themselves.
5. In plotting material from the Kenyan case relating to seed-system functioning, economic and political constraints leap forward as a major farmer-articulated constraint. Furthermore, the analysis shows that focusing on seed and variety issues, *per se*, can be ineffective for dealing with the real bottlenecks in many seed-system situations.
6. The issue of 'right seed/crop' is examined in the context of emergency versus non-emergency situations. At a minimum, crops/varieties for emergency interventions need to be:

- adapted to farmers' bio-physical environment
- adapted to farmer's preferences
- adapted to farmers management conditions
- those that facilitate risk aversion.

'Right variety/crop' is also examined by differentiating acute, repeated acute, and chronic seed-system stresses.

7. Hybrid maize is a poor choice in the context of acute, repeated acute, and chronic stress situations. Most farmers do not routinely access hybrid maize seed from the stockist, do not have the management expertise, and may not even have the appropriate bio-physical environment in which nurture the 'aid' varieties. Suboptimal environments and limited knowledge do not tally up to promoting risk-aversion during a stress period. Further, the built-in deterioration factor for hybrids does not necessarily promote self-reliance in the longer-term for those farmers who cannot afford to renew their stocks on an annual basis. Simply put, the overriding bias on hybrids—which have been developed mostly for more favored environments, although recently hybrids have been developed for short-season environments—makes the situation somewhat an extreme case of ignoring basic emergency principles.
8. A range of seed-system support interventions in East Africa is reviewed. These interventions go beyond seed-and-tools and have various aims including delivery of more locally adapted varieties, ensuring that even the poorest farmers can get new materials, improving the quality of farmer seed, and even helping farmers earn money from seed-production operations. The review illustrates that a body of work is emerging to help address some of the more chronic constraints to seed-system health.
9. A paramount challenge to strengthening the systems by which farmers access seed rests in a more refined diagnosis of where the constraints and opportunities lie. Analysis of seed systems—whether a farmer system, the formal sector, or a system that aims to integrate the two—is a relatively new field. Prior to a decade ago, development work focused almost exclusively on supporting the institutionalized or formal seed sector. In Africa, seed-system experts estimate that such institutional channels may supply farmers with, at most, 5% of their seed, the obvious exception being maize in areas where hybrids are well adapted and have attained wide use.
10. The section ends by starting to sketch the full components of a seed system and their interlinking relationships. (The companion volume lays out a more complete methodology for diagnosing such strengths and weaknesses.) Continuing to deliver seed-and-tools may be analogous to putting a band-aid on a gushing wound. However, more targeted diagnosis lays the foundations for more targeted interventions—interventions that have longer lasting positive impacts.

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**A CASE STUDY OF LESSONS LEARNED
IN EMERGENCY SEED-AID IN KENYA**

A Proposal to USAID

*Submitted by Centro Internacional de Agricultura Tropical (CIAT)
in conjunction with Mississippi State University (MSU)*

Project Purpose

This project aims to improve the design and implementation of future seed relief efforts in Eastern and Central Africa by providing an analysis of a case study in Kenya.

Development Rationale

Donor expenditures on emergency relief in Eastern and Central Africa have been rising steadily, with a corresponding depression of funding to development efforts. Immediate needs for food aid in response to droughts, other natural emergencies and civil insurgencies represent a large part of this increase. Provision of crop seed to farmers in order to aid a recovery of production is often a component of such programs; according to some, the United States Agency for International Development (USAID) alone spends \$20 million annually on emergency seed programs. While the response is appropriate, it is not sustainable, does not contribute to long-term development efforts and has in some cases harmed the recovery of long-term production through the introduction of poorly adapted varieties.

Relief efforts can be improved by identifying appropriate roles for, and coordinating the efforts of donors, non-governmental organizations (NGOs), the private sector, the public sector (national research and extension systems), and international agricultural research centers (IARCs). Efforts that also have the effect of strengthening local and/or regional seed systems can be expected to have longer-term benefits. Lack of knowledge on how local seed systems function (how, where and when farmers of different categories obtain seed of different crops) often limits the diffusion and adoption of new varieties even in favorable times; weak seed systems make the entire system less resilient in times of stress.

A recent review of seed aid activities concluded that few in-depth analyses had been carried out following the end of an emergency (Overseas Development Institute, 1996). One well-analyzed case concerned the Seeds of Hope (SOH) project (Sperling, 1996). This project will contribute to addressing this lack of information by providing a detailed analysis of one case study, related to the provision of seed aid to Kenya during and immediately after a serious drought in the period 1995-1997. This proposed Kenyan case study would complement the SOH case by focussing on a country with a better-developed infrastructure for seed production and marketing, including an active private sector that was missing from Rwanda.

Objectives

The five main objectives may be summarized as follows:

1. Draw overall lessons on organizational effectiveness of the seed aid acquisition and distribution process: donors' point of view
2. Assess the general appropriateness of the seed aid package

3. Draw overall lessons on the effectiveness/equity of the local distribution process: farmers' point of view
4. Synthesize farmer assessments on the type of seed aid delivered
5. Assess the effectiveness of the seed aid itself in supporting and stabilizing the farming system

Activities and information needs

A history of the seed situation in Kenya will be examined for the past 10 years, using secondary information from public and private institutions, although the main focus will be on the emergency relief of 1996/97. It will be important, in view of the possible effects of timing and type of food aid upon the use and appropriateness of the seed aid, to make some assessments of the overall aid package delivered in Kenya: food aid and tools, as well as the seed of each crop (principally sorghum and maize).

The whole seed aid process would be more cost-effective over the long-term if distributed seed were used not simply as a stop gap measure, but made a contribution over the long-term. Farmers themselves are well placed to comment on whether there were distinct positive or negative effects of the seed aid on farming community equity. While institutional and national-level experiences and perspectives will be important, local recommendations may need to be tailored accordingly.

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Annex II

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Annex III

Sites of Fieldwork

District	Division	Location
Mbeere	Gachoka	Kiambere
"	"	Mbeti South
"	"	Mbeti North
"	"	Rwika
"	Mwea	Makima
Machakos	Kathiani	Kaewa
"	Masinga	Kangonde
"	"	Masinga
Baringo	Kabernet	Orokwo
"	Marigat	Kapkuikui
"	"	Ilchamus
"	"	Eldume
Baringo	Tenges	Tenges
"	Salawa	Kiboino
Makueni	Kibwezi	Utithi
"	"	Kikumbulyu
"	"	Kinyambu
"	Makindu	Kiboko
"	"	Mulili
Thika	Thika	Ngoliba

Uganda Seed Workshop Program, June 2000
"TARGETED SEED AID AND SEED SYSTEM INTERVENTIONS:
STRENGTHENING SMALL FARMER SEED SYSTEMS IN EAST AND CENTRAL
AFRICA"

Workshop funded by USAID grant #LAG-4111-00-3042-00

Co-hosted by:
International Center for Tropical Agriculture
Catholic Relief Services
Overseas Development Institute
National Agriculture Research Organization, Uganda

June 21-24, 2000
Kampala, Uganda

Day 1: June 21, Wednesday

Session I: INTRODUCTION

8:00- 8:30 Welcome remarks: NARO, CIAT, CRS

8:30- 9:00 Objectives of workshop: Louise Sperling and Tom Remington

9:00- 9:30 Introduction of participants

9:30-10:00 Coffee/Tea

Session II: THINKING ABOUT FARMERS' SEED SYSTEMS:
WHAT ARE THEIR COMPONENTS?

(this includes all seed systems farmers' use: formal, intermediate, less formal)

10:00-11:30

a) Conceptual components of seed systems

Shawn McGuire (Wageningen Agricultural University):

Some conceptual components of seed systems

Eva Weltzien (International Center for Research in the Semi-Arid Tropics)

Seed systems and their potential for innovation: genetic diversity, institutions and their linkages

GROUP DISCUSSION

11:30-13:00

b) Diagnosing the 'health' of farmer seed systems

who, what, how to develop indicators of 'health'/ stress

Kate Longley (Overseas Development Institute)

The health of farmer seed systems

GROUP DISCUSSION

13:00- 14:00 Lunch

14:00- 16:00

c) Diagnosing of different type of Disasters/stresses

d) Diagnosing different types of Seed System constraints: acute, chronic, repeated acute---

Tom Remington (Catholic Relief Services)

Guidelines for the assessment of the impact of disaster on smallholder agricultural systems

GROUP DISCUSSION

16:00-16:30 Coffee/Tea

16:30-17:30 Synthesis of the day: Lessons, issues to discuss further, Implications for guidelines

Day 2: June 22, Thursday

8:30-11:00

Session III: SEED SYSTEM INTERVENTIONS DURING EMERGENCY/REHAB PERIODS; REFLECTIONS ON LESSONS LEARNED FOR SEED SYSTEMS IN ACUTE STRESS (OR REPEATED ACUTE STRESS)

Louise Sperling (International Center for Tropical Agriculture)

A case study of lessons learned in emergency seed aid in Kenya

Jon Magnar Haugen (Norwegian Agricultural University)

Seed systems of small farmers in Honduras--their relevance for interventions

Sigrid de Brabantare (Norwegian Agricultural University)

Study on decision-making processes in seed supply and seed distribution interventions in emergency situations: the case of Honduras.

Anton Bua and G. Acola (NARO- Uganda)

Multiplication and distribution strategies for improved cassava varieties in Uganda

Christoph Langenkamp (ICRC-Somalia)

Emergency seed interventions in Somalia; a reflection on the current situation

11:00- 12:30 Synthesis session III: lessons, issues to discuss further, implications for guidelines

12:30-13:30 Lunch

13:30- 14:30

Session IV: SEED SYSTEM INTERVENTION FOR CHRONICALLY STRESSED SYSTEMS: (STRENGTHENING SYSTEMS); RELFECTIONS ON LESSONS LEARNED-- AND IMPLICATIONS FOR ACTION

Soniia David (CIAT-Africa)

Seed systems interventions in eastern Africa for chronically-stressed situations (with emphasis on bean-related activities)

14:30-15:30 Synthesis sessions: lessons learned, issues to discuss further, implications for guidelines

15:30-16:00 Coffee/Tea

16:00- 17:30

Session V: LINKING EMERGENCY WITH REHAB AND SUPPORT TO CHRONIC STRESS SITUATIONS

Diress Mengistu : Norwegian People's Aid: South Sudan Program

Linking Emergency with Rehabilitation and Support to Chronic Stress Situation

GROUP DISCUSSION: SYNTHESIS SESSION

Day 3: June 23, Friday

8:30- 11:30

Session VI: WORKING GROUPS I

- a) Diagnosizing seed system constraints components
type possible of constraint
Indicator development
- b) Guidelines to encourage the link between emergency to rehab—and encouraging the development of sustainable sytems
- c) Diagnosing different types of 'disaster' within Farming System Perspective

11:30-13:00 WORKING GROUP Report back

13:00-14:00 Lunch

14:00- 16:00 WORKING GROUPS II-- refining same themes (may want to change composition of groups

16:00- 17:30 WORKING GROUP Report back

FINAL 'Substance' PRODUCT BY END OF DAY

Day 4: June 24, Saturday

8:30- 12:30 NEXT STEPS (including collaboration)

- practical action
- further development of conceptual tools
- refinement of guidelines
- joint grant proposals?
- training needs

12:30- 13:00 Closure of workshop

Annex V

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AN INVENTORY OF SEED SYSTEM SUPPORT INTERVENTIONS IN EASTERN AFRICA

Prepared by Soniia David, International Center for Tropical Agriculture (CIAT)

1. Plant Breeding

Project: Participatory Plant Breeding with Women and Small Farmers in Africa and Latin America

This project, initiated in 1996, explores methods of collaborative plant breeding with farmers at three sites in Ethiopia, one in Tanzania, and one in Colombia. Its rationale is that both beans and cassava (the crop foci) are key small-farmer crops and crucial for urban consumption and for delivering export revenue. Yet formal plant-breeding research to-date has had less impact than expected (newly released varieties are often unpopular among farmers and processors, especially women, because of undesirable seed colors/sizes; culinary attributes, such as taste and cooking time; agronomic characteristics, such as being poorly competitive with weeds; and poor processing potential due to starch quality and storage life).

The project, which is a collaboration between CIAT and NARSs partners and is funded by DFID UK, has several common features at all sites. Multiple diagnostic methods are contrasted/compared to get a refined view of farmer preferences; farmers are exposed to numerous fixed and segregating lines so as to encourage a diversity of cultivars to be tested and evaluated; variety screening is quickly decentralized to the community level to allow for site-specific adaptation; and seed production and distribution is built into the 'breeding' design to allow several varieties to be diffused at once and sustained in communities in their local farming systems.

The Tanzanian site is distinctive in that it started work with farmers using segregating lines (starting with F₄) while the other sites focus on stabilized materials.

2. Seed dissemination

Project: An investigation of alternative bean-seed marketing channels in Uganda

In assisting national commodity programs in devising cost-effective delivery systems, collaborative research was conducted by CIAT in Uganda to test the appropriateness of bean-seed distribution through four unconventional channels: rural shops, a rural health clinic, women's groups, and an NGO. The findings confirm the feasibility of distributing seed packets through market and non-market channels and show that each delivery system has advantages and disadvantages that must be assessed by seed suppliers in a country-specific context. The report offers guidelines for the distribution of new bean varieties by formal institutions (David et al. 1997).

Project: Seed dissemination through rural stockists in Tanzania

In 1996—97 the Tanzanian National Bean Program and CIAT implemented a pilot project to test the suitability of selling seed of modern bean varieties through rural stockists.

Project: Dissemination of new bean varieties in Malawi

From 1996—1998, the Malawi Bean Improvement Program (BIP) organized the production and sale of small seed packs of six new bean varieties. The packs were of three sizes: 100 g, 250 g, and 500 g. The varieties were also promoted through posters and radio announcements. Packs were sold at a price below cost-recovery. All merchants interviewed during a follow-up study expressed interest in continuing with the sale of small packs and most said that they would be willing to pay for the small packs at the beginning of the season (Phiri et al. 2000).

Project: The appropriateness and effectiveness of drama as an agricultural extension tool

In 1996 the Ndere Dance Troupe, CIAT, and the Agroforestry Research Network of Africa (AFRENA) implemented a project to disseminate information on climbing beans and multipurpose agroforestry trees in Uganda through drama. Technical messages on new bean varieties and agricultural and social practices were effectively communicated to women farmers. Although the organizers had planned to sell seed of the bean varieties during the performances, this was never done (for unknown reasons). Thus, this project provides an example of a missed opportunity for seed dissemination (Munro, 1998).

Project: Approaches for dissemination of new bean varieties in urban areas

One of the main objectives of this project, initiated in 1999 by CIAT and the Uganda National Bean Program, was to test different strategies for the promotion and dissemination of new bean varieties in urban areas.

Community meetings were held in two communities in the capital city of Uganda (Kampala) to decide on sale outlets. At the start of the main season, 210 kg of five new bush-bean packed in 250 g packets with labels in local languages, were delivered to local authorities in the two communities for sale. Seed distributors were compensated with 30% of sale earnings. Posters promoting the new varieties were also distributed to sale outlets. Seed sellers were requested to keep records of sales and to limit sales to 500 g of each variety per household. Two demonstrations per community were established to introduce two new climbing beans (Vunikingi and Umubano varieties), a new technology to most Kampala farmers.

Farmers rejected seed sales through several channels that have proved effective in rural settings (e.g., clinics, shops). Shops were rejected because of shopkeepers' tendency to mix in seed of dubious quality, the desire to limit sales to community members for purposes of the study, and the need to account for sale proceeds. Because clinics were under-staffed and the study required record keeping, it was difficult to find clinic staff willing to take the responsibility for selling the seed. Lack of space to store the seed in clinics was also problematic. Seed was sold through the offices and homes of local authorities, at local meetings, and through door-to-door sales. Over a six-week period, 136 kg of seed were sold to 165 farmers. Women buyers outnumbered men (121 compared to 44) in both communities.

Major problems encountered with selling through local authorities included limited efforts to widely promote and popularize the varieties because of other commitments, the frequent absence of local authorities, and the centralized nature of selling from homes and offices, which limited farmers' access to the seed. One conclusion of the study is to avoid using local leaders to distribute seed. Because issues of mistrust may be more prevalent in urban areas, distribution through other types of commercial channels may be more appropriate in towns. These may include agricultural supply shops, roadside kiosks, market vendors, and churches.

3. Seed management

Project: Pelum Association seed-security program

The purpose of the program is to strengthen the capacity for training in seed security, networking, and improving the capacity of small-scale farmers to maintain and develop quality and diverse seed and planting materials for food and livelihood security. The program implements training programs on seed security for community extension workers in Eastern and Southern Africa and is developing a manual for extension workers on seed security (Contact: PELUM, Harare, Zimbabwe).

4. Seed Enterprises

Project: Commercial enterprises for producing cassava cuttings in Uganda

See paper presented at the complementary Uganda workshop.

Project: Developing farmer seed enterprises (FSEs)

Between 1994 and 1997, CIAT conducted a pilot study in Eastern and Central Uganda to develop modalities for supporting specialized farmer seed producers. Beans were the target crop. Farmer seed enterprises are proposed as a sustainable approach for disseminating new crop varieties, although the approach can also be used to produce good quality seed of local varieties.

The pilot project supported four farmer groups in Mbale, Iganga, and Mukono districts. Farmers received training in seed production, business practices, bookkeeping, and group dynamics. A participatory approach was used in training and in all aspects of developing FSEs. To minimize the farmers' risk-taking, stress ownership of the business, and avoid creating a dependency mentality, equipment and seed were provided on a cost-sharing basis between farmers and CIAT.

FSEs multiplied two new bean varieties: K132 and K131. Production and productivity by all three enterprises was disappointingly low: the Ikulwe Bean Farmers' Association produced the most seed over seven seasons (2561 kg), followed by Budama Women's Group (535 kg produced over four seasons) and Makhai Women's Group (478 kg produced over four seasons). Yields per unit area (689—866 kg/ha for K132 and 369—610 kg/ha for K131) and multiplication rates (a range of 5—9 for K132 and 7—9 for K131) were modest for sole cropping. Five factors account for the low yields of seed growers: adverse climatic conditions (drought, hailstorms, heavy rains), high disease and pest incidence, poor cultural practices (poor land preparation, late planting, wide spacing), lack of access to resources such as land and oxen, poor soils and/or low soil fertility. By 2000, two of the four groups were still involved in seed production and had developed local markets.

The Ugandan case studies confirmed two important points. First, small-scale African farmers can be organized and motivated to produce and sell good-quality bean seed. Second, demand exists among smallholders for good-quality seed of new varieties supplied by specialized farmer producers. While FSEs offer a sustainable solution to the problem of seed supply, the challenge of implementing this approach in Eastern and Southern Africa remains formidable. Collaborative linkages need to be fostered between farmers, researchers, NGOs, and the formal seed industry. Seed-policy reforms need implementing and more client-oriented research systems must be institutionalized.

Project: Arid and Semi Arid Land (ASAL) Program

In collaboration with the Kenya Agricultural Research Institute (KARI), the Arid and Semi Arid Land (ASAL) Program in Laikipia District, Eastern Kenya, supported community-based seed-production activities between 1996 and 1999. The crops involved were potatoes, beans, chickpea, trees, and safflower. Stringent criteria (e.g., access to irrigation water for off-season production) were used to select potato-seed growers. Training of producers covered crop husbandry, group dynamics, leadership, bookkeeping, and marketing. Farmers paid 50% of cost for potato seed and fertilizer and the remaining amount after the harvest. In 1999 the project was assisting farmers in making direct contact with the national potato research institute in order to secure source seed on a regular basis. The project bought back the initial amount of seed given for some crops (beans, safflower).

Project: Uganda National Seed Potato Association

In 1995, a group of farmers in Kabale and Kisoro Districts, Uganda, formed an association to produce potato seed commercially after receiving training from the National Agricultural Research Organisation (NARO) and CIP. The association, Uganda Seed Potato Producers Association (USPPA), is now a registered company. Members of USPPA purchase seed potatoes from a nearby research institute, which also provides technical support (training, seed inspection, and economic analysis). In 1999 the association consisted of 18 members: 11 men and 7 women. Most producers are above average in terms of resources since the association requires all members to have an initial capital outlay to construct a seed-potato store, purchase pesticide and spray pumps, and have enough land for planned rotations and fallowing. On average, production for individual producers is above 15 t/ha.

Project: Rwanda Emergency Agricultural Project, World Vision International

The emergency phase of the project (1994-95) sought to multiply improved crop varieties and improve their supply after the war. In Gikongoro, Kanazi, and Ruhengeri, the project organized contract farmers to multiply beans (bush/climbers) and potatoes. There was an effort to make seed production more sustainable and commercially oriented during phase 2 of the project (1995-96) by working with farmer associations. Work also began in other prefectures during phase 2. The project ended in January 1999.

The project assisted farmers in organizing themselves into associations (made up of various farmer groups) and in opening stores to sell inputs. In some areas, associations already existed, and in others areas, pre-war associations were reactivated. Seed production is done by groups that work under larger associations. Where land is scarce (e.g., Umutara), farmers produce seed individually and pool their harvest.

The project provided formal training in both seed production and financial and business practices to the seed committee of each association. It is not clear whether producer groups received any training directly.

Farmers produced seed of the following crops, depending on the prefecture: beans, potatoes, groundnuts, soybeans, maize, wheat, sweet potatoes, and cassava. Groups produce a minimum of two crops and a maximum of four. Source seed was provided by the project; because of the collapse of the formal seed sector, no provision was made to enable farmers to access source seed on their own. Project staff checked seed quality (germination, moisture content) in beans only and provided packaging materials for beans for a short time.

Project: Seed production by women's groups in northern Tanzania

Since 1999, the Tanzanian National Bean Program has worked with 17 women's groups in the Arusha area to address the seed-supply constraint. The groups are being developed as commercial units to produce seed of modern bean varieties. The project is attempting to link the groups with stockists to address the

problem of marketing and demand (Contact: Selian Agricultural Research Institute, Arusha, Tanzania).

Project: Improving seed supply in benchmark sites of the African Highlands Initiative

The African Highlands Initiative is seeking to address the seed-delivery bottleneck by supporting efforts to establish local seed production units in seven of its benchmark sites in Kenya, Uganda, Ethiopia, Tanzania, and Madagascar. Priority crops are identified by farmers and the modalities for seed production are formulated by various stakeholders, including NGOs, researchers, the formal seed sector, local entrepreneurs, and farmers.

Activities involve seed production by farmers (groups and individuals), schools, and church organizations of potatoes, sweet potatoes, beans, rice, wheat, sorghum, forages, indigenous vegetables, which vary by site (David, ed. 2000).

Project: Kagera Agricultural and Environment Management Project, Tanzania

The IFAD-funded Kagera Agricultural and Environment Management Project supports commercial seed production activities for the following crops: OPV maize, beans, bananas, cassava, and clonal coffee. The project began in 1998 and operates in five districts of western Tanzania. Individual farmers are identified (nominated at village meetings) and trained for two days in seed-production methods. Training only covers agronomic and post-harvest handling. Participating farmers must be able to devote half a hectare to seed production. Farmers are given seed and other inputs as a grant. Foundation seed is produced by contract farmers in each district. Seed producers are supervised by district seed supervisors trained by TOSCA, the national certification authority, and village extension officers. Production is low (250 kg per season for beans). The project offers no assistance in marketing.

The project plans to organize producers into groups to enable them to access credit and to boost production. In 2000, the project worked with more than 1000 seed producers.

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END NOTES

- ¹ The case study explored farmers' routine crop and seed-procurement strategies to determine how 'abnormal' the practices were (or were not) during the designated emergency. To-date, seed aid has been given without diagnosing what the constraint may be. There has also been little effort to examine the resiliency of farmer agricultural or seed systems, or to question whether giving farmers the seed physically is the best among several potential strategies.
- ² Specific manuals on seed aid are even more recent and date within the last five years: ODI 1996; Oxfam 1999; Concern, n.d.
- ³ Drought should not be equated with a lack of rainfall, *per se*, but rather the degree of rainfall, which induces a shortage of some vital economic good such as a harvest or forage. Sandford (1979) explores this relative notion of *drought* in some detail.
- ⁴ This issue of food costs versus seed costs is pursued more fully in the complementary workshop volume.
- ⁵ The Diocese at Embu, recognizing a growing sense of seed-aid dependency, has proposed "seed-payback mechanisms" (Father Irezi, Diocese of Embu, personal communication, 1998).
- ⁶ In Machakos, several farmers not only listed emergency aid as a routine source for maize seed, but food stores as well.
- ⁷ The issue of seed-system diagnosis is the central theme of the companion volume emerging from the workshop on "Targeted seed aid and seed-system interventions: Strengthening small-farmer seed systems in East and Central Africa."

