

## 8. COMMUNITY SEED SYSTEMS

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Members of the farmer field school in Agoriata village examining their yam multiplication plot (eastern Uganda).

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### Seed insecurity in rural Africa

Seeds represent an indispensable asset for farming. They include both generative and vegetative propagating parts of plants that safeguard the production and reproduction of agriculture. Seed security and food security are strongly connected (FAO, 1998).

Seed security can be defined as a state in which farmers have access to sufficient amounts of viable seed to conduct their farming practices, with due regard to the diversity of crop genetic resources that they need for food security and they prefer for cultural reasons. Seed security relies upon economic, agroecological, nutritional, cultural and technical factors, as follows:

- Economic factors: e.g. seed access, affordable seed supply.
- Agroecological factors: e.g. adequate seeds to manage local agroecological conditions.
- Nutritional factors: seed diversity needed to meet household nutritional needs.
- Cultural factors: seed diversity to suit local food habits and customary farming practices.
- Technical factors: e.g. ability to save seed on-farm, local seed selection and breeding.

Among poor farmers in rural Africa, seed insecurity is a recurrent problem, even worsening in recent times due to a wide range of causes (box 29). In addition, field research in different rural areas of East Africa revealed that the HIV/AIDS epidemic is further aggravating seed insecurity, mainly due to the associated economic and labour impacts (box 30).

### **Box 29. Selected causes of seed insecurity in Africa**

- Crops left in the field overtime due to various reasons (such as lack of labour, sickness, or civil strife) impair the provision of viable seed for following crop seasons.
- Poor harvests due to factors such as climate, pests, or deficient farming practices result in a reduced provision of farm-saved seed.
- Famine shocks deplete farm-saved seed to meet household food and survival needs.
- Formal seed production and distribution mechanisms, both public and private, often focus on a narrow group of crops and varieties that do not suit the diversity of crops and farming systems of small-scale farmers.
- Certain seed improvement technologies and the arbitrary introduction of "improved" varieties disrupt local genetic resource dynamics and undermine farmer seed systems, due to crop gene flows between modern and farmer varieties and genetic displacement.
- Poverty and destitution impede the purchase of seeds.
- The reduction of public agricultural extension services weakens one of the few external seed sources that were available and affordable for the rural poor.
- Credit-based seed provision schemes are often inaccessible or unaffordable to poor, vulnerable and destitute farmers, who are precisely those in most need of seed.
- The expansion of the private seed industry benefits big farming systems to the detriment of smallholder farmers, creating the false illusion that seed systems are developing.
- The absence of community-based seed systems limits options towards farmer seed autonomy through the local conservation, improvement, production, and distribution of the seed diversity required by farmers.
- Inadequate facilities and methods for seed storage impair the maintenance of sufficient and safe seed resources, mostly due to poverty, lack of labour, and insufficient technical and financial support.
- Civil strife and war erode the basis of seed security owing to disrupted farming practices, devastated cropland, and forced displacement, among others.
- Food and seed aid introduces alien genetic resources that disrupt farmer seed systems.

*Source:* Personal elaboration based on miscellaneous sources and field research.

### **Box 30. AIDS impact on seed security**

- In AIDS affected households, labour stress impairs farming practices and consequently affects the provision of sufficient amount, diversity and quality of farm-saved seed; partly due to reduced cultivation area, decline in the crop diversity farmed, poorer yields, and inadequate timing for seed selection.
- AIDS affected households are at a higher risk of suffering food shortages and thus be forced to consume their saved seed in order to meet immediate food needs.
- AIDS affected households suffer impoverishment that limits their ability to buy seeds.
- AIDS affected households suffer labour and economic constraints that impair their maintenance of adequate granaries and seed storage structures.
- AIDS affected households may suffer a reduced participation in community life due to sickness, time shortages or social discrimination, thus losing opportunities for seed access through community interaction and community support mechanisms.
- AIDS affected households require more comprehensive and versatile seed systems, particularly including access to a broader range of seed diversity, so to maintain sufficient flexibility and options to cope with their pressing conditions.

*Source:* Analysis based on field research conducted in Ethiopia, Tanzania and Uganda (2001).

In general, field research and reports from the field indicate that seed insecurity is expanding among the rural poor and is aggravating their food insecurity. Poor farmers often lack sufficient amount and diversity of seed to properly conduct agriculture. Seed insecurity is more acute among the poorest farmers, including female-headed households and AIDS affected households. In particular, AIDS-affected farmers indicate that their labour and economic constraints unable them to secure and access the variety and amount of seed they need (box 31). They also lack alternative mechanisms for seed security. In such households, seed insecurity further impairs their capacity to cope with food insecurity risks and the AIDS impact. In fact, seed insecurity narrows the options for planning and conducting agricultural systems in ways that better address the circumstances and needs owing to HIV/AIDS. Adequate seed resources are useful to cope with specific agroecological conditions, to optimise the use of available labour capacities, to meet nutritional needs, and to explore livelihood choices. In consequence, seed insecurity creates a downward cycle of food insecurity.

Furthermore, seed security is indispensable for the effective implementation of the agrobiodiversity components that have been examined throughout this strategy paper, in previous chapters. In this way, seed security is essential to effectively promote neglected crops, conduct agricultural diversification, and improve home gardens.

### Box 31. Seed insecurity among farmers suffering from HIV/AIDS:

#### The case of Joyce Igoru

Joyce is a woman farmer suffering from HIV/AIDS who lives in central Uganda. She is a widow with two children and limited land available. She reports experiencing severe and aggravating seed insecurity, in similar patterns as many other AIDS-affected households report. At time of seeding, Joyce Igoru lacks enough seed due to different causes, including:

- she could not save enough seed in the previous agricultural season due to labour constraints;
- she lacks labour capacity and economic resources to improve granaries and seed storage facilities, which results in damages to her food and seed resources through time;
- she had to use some saved seed to feed her children and escape famine;
- she cannot afford to buy seeds in the formal sector because "they are expensive"; and
- there are no solid community mechanisms for local access to seed.

As a consequence, seed insecurity worsens her situation and creates a downward cycle of food insecurity and further seed insecurity.

In addition, Joyce indicates she was among the latest people in the village to get cassava seeds of the *nigera* variety. This variety is resistant to the cassava mosaic virus and arrived to the community after a massive incidence of this crop disease in East Africa in the mid-1990s. The fact that a highly vulnerable household as hers was the latest to get seed (some seasons later than the first households got it) represents a community failure in the distribution and exchange of seeds. Therefore, community seed systems could represent an important mechanism to bring more equity in seed access and to improve the agricultural prospects of the poorest and most vulnerable families.

Joyce Igoru indicates that she would like to improve her access to seeds and, particularly, to seeds of more crop varieties. For instance, when farming cassava, she currently uses three varieties, and she thus needs to access and manage seed diversity: *ongada* is an early maturing variety that provides her with a fast food supply; *aladu* is an indigenous variety with notable resistance to cassava mosaic virus (aside from being the best variety to feed her children, with good palatability and a good market value); and the introduced variety *nigera* is resistant to the cassava mosaic virus and easy to harvest. Accessing seed diversity, in terms of



both crops and varieties, allows her to better plan agricultural activities according to her land availability, agroecological conditions, labour capacity, food and nutrition needs, and economic circumstances. However, insufficient seed diversity reduces her options and coping capacities to achieve food security and overcome HIV/AIDS constraints. Joyce Igoru indicates that there are not community mechanisms for access to seed, that accessing seeds from outside the village is difficult for her alone, and that improved seeds are unaffordable for her. When discussing about building community seed systems, she indicates this would improve her access to affordable seeds and to sufficient seed diversity, as well as expanding her seed knowledge and even allow her to engage in some seed experimentation with fellow farmers.

Farmer Joyce Igoru looking at a local variety of cassava in her field (central Uganda).

Source: Field research in central Uganda, 2001. Joyce Igoru gave permission to diffusing her case in order to raise awareness on the situation of AIDS affected families.

## **Formal versus farmer seed systems**

The major seed arenas are formal seed supply systems and farmer seed dynamics. The formal seed sector consists in the comprehensive system of modern plant breeding, certified seed production, and seed marketing (Louwaars, 1994). Farmer seed systems represent the wide range of farmer and indigenous practices in seed selection, improvement, conservation, production, and exchange.

Farmer seed systems are the most important source of seed in the world, more so in Sub-Saharan Africa. They are at the roots of plant domestication and agricultural development, and account for most of the vast crop genetic diversity in the South. Farmer seed systems remain an active source of crop diversification and evolution, but are increasingly constrained and impaired because of socio-economic discrimination, institutional neglect and the impact of formal seed breeding systems.

Formal seed systems carry out advanced seed breeding and qualitative seed production, yet they supply only a small portion of the total amount of seed planted by farmers and of a limited range of crops only. The institutional support for formal seed breeding and supply systems has not resulted in significant improvements in seed security among smallholder farmers, but in some cases has increased their seed vulnerability. In fact, the widespread promotion and overestimated importance of formal seed supply systems in the developing world has resulted in the virtual denial and rapid erosion of farmer seed systems (Louwaars, 1994). The uneven relationships between formal and farmer seed systems have impaired the accomplishment of seed security among poor and smallholder farmers in Africa, particularly through two simultaneous processes: (i) the scientific and institutional support for formal seed systems, with a bias towards supporting large-scale and commercial agriculture; and (ii) the persistent neglect, even despise for farmer seed dynamics.

Seed interventions need a profound reconsideration. The poor connection between formal and farmer seed systems is a key concern (Almekinders and Louwaars, 2002). There is a pressing need to generate and deploy grassroots seed strategies that truly attend the conditions and needs of smallholder farmers, especially those that are poor, those that rely on seed diversity for nutrition and livelihood, and those that suffer major difficulties such as AIDS impact. Accordingly, the issue of seed security requires the following considerations in agricultural development policies and programmes:

1. Examine critically formal seed systems in order to visualise their perverse impacts and adjust their potential to the specific needs of smallholder farmers.
2. Recognise the values of, and improve farmer seed dynamics.
3. Build community seed systems as a strategy for integrated, grassroots-oriented and participatory seed security.

## A critical analysis of formal seed systems

The formal seed sector emerged with the aim of improving agricultural production through targeted seed research and technological efforts. It focuses on producing improved crop varieties with higher yield potential and on delivering high quality seed. However, the formal seed sector has often resulted irrelevant, if not detrimental, to the circumstances and needs of subsistence and smallholder farmers (box 32).

### **Box 32. Limitations and impacts of the current formal seed sector**

- The formal seed sector usually focuses on uniform and predictable environmental conditions, yet most farmers inhabit and confront a wide range of agroecological conditions and risks.
- The formal seed sector serves predominantly farmers that conduct high-input agriculture (based on chemical use and capital investments), that can rely on crop specialisation, and that have good prospects of agricultural market exchange. However, most farmers in Africa are poor, need to manage a wide range of crops for food and livelihood security, and are permanently struggling with market integration.
- Formal seed systems attend a limited range of crop genetic diversity, yet many poor farmers rely on agrobiodiversity to sustain agriculture and coping with their most pressing agricultural development needs. Formal seed systems focus on selected crops with market value, therefore neglecting the agrobiodiversity dynamics of many rural people. In other words, the number of crops and varieties produced and distributed through the formal seed sector is very limited compared to the genetic resource portfolio that African farmers need and use.
- The current formal seed sector erodes the resilience and sustainability of local genetic resource systems. The technical means used for modern seed breeding and the impulsive diffusion of improved varieties often generate random genetic crossings at the farmer level. Smallholder farmers often report that improved seeds have "anomalous" behaviour that confuses them, disrupts their seed resources, and impairs their agricultural practices. Hybrid and composite varieties are indiscriminately distributed in rural areas without adequate information and awareness on their potential effects on local crop genetic resources and customary practices for saving seed on-farm. These "seed drifts" undermine the stability of farmer varieties and disrupt local seed management systems. Consequently, farmers suffer uncertainty and increasing distrust over both their own varieties and the introduced ones. Agricultural and seed experts aggravate the problem when unilaterally encourage the expansion and adoption of improved varieties, with no consideration for the conditions and concerns of farmers. The features, limitations and potential risks of adopting modern improved varieties are insufficiently communicated to farmers when such resources are released, distributed and promoted. This erratic, misinformed and even paternalistic dissemination of modern crop varieties among smallholder farmers causes seed and agricultural vulnerability, which in turn aggravates seed insecurity.
- The centralised seed production framework has been built to resemble the successful European and North American seed industries (Louwaars, 1997), with little consideration to the different agricultural, economic and productive conditions of most African countries.
- The formal seed sector is at odds with the economic conditions of poor farmers. The adoption of formal sector's seeds often engages farmers in a seed dependency cycle. For instance, the use of pure breed selection methods in the formal seed sector requires farmers to purchase new seed every seeding season because such seeds undergo rapidly genetic decline and breakdown. In addition, modern varieties are often unaffordable to poor farmers. The impoverishment of rural people and recent privatisation trends in the formal seed sector are further processes that reveal the disharmony between formal seed systems and the conditions of poor farmers.

Overall, seed programmes and policies have for decades ignored the agricultural, food security, nutrition and livelihood needs of most smallholder and poor farmers in the developing world. New trends of privatisation and genetic manipulation in seed production are likely to exacerbate this situation and, therefore, perpetuate, if not worsening, seed insecurity among poor African farmers (box 33).

### **Box 33. Trends of privatisation and genetic manipulation in seed production**

The privatisation of formal seed systems along with a crisis of the public agricultural sector in the developing world are further limiting the options for seed security among smallholder farmers. Agricultural extension services, which often represent feasible and affordable sources of seed for poor farmers, are either shrinking or suffering funding shortages. The private seed sector is gaining increasing political and public space, yet not necessarily with the aim to, or capacity of better serving the needs of the poorest farmers. The private seed sector focuses on medium to large-scale farming, on specific crops with top market prospects, on agriculture in favourable environments, and on its own plans for crop development. The seed security needs of poor farmers are again left aside. At some extent, the private seed sector also influences the public agricultural development agenda, with limited options for participatory approaches to seed security. Despite the formal private seed sector is able to provide high quality seed, it does not help the seed diversity dynamics of poor farmer households.

In addition, several countries in Africa are suffering increasing corporate pressures to adopt genetically-modified crops through both political influences and aggressive marketing. The new transgenic seeds for selected crops are expensive for poor farmers and hence a threat to their economic security (Garí, 2002b). They also entail serious environmental risks. In addition, the whole debate on genetically-modified crops drives attention on local genetic resources and farmer seed systems away from the public and policy arenas.

These privatisation and genetic manipulation processes may simply left seed insecurity problems unresolved, providing no tangible means for coping with it at the grassroots level. The poorest and most vulnerable farmers, such as orphan-headed households and AIDS affected households, will simply be left behind because the ongoing policy objectives for seed production and privatisation have little significance to them.

Most of the analysis expressed above (boxes 32-33) suggests that the formal seed sector in its current trends is irrelevant to most of the circumstances and pressing needs of AIDS affected households. Although breeding crop varieties that are labour-saving and nutritionally valuable can be a promising line, the way formal seed systems work will not likely benefit poor AIDS affected households. For poor farmers, the formal seed sector is often irrelevant and detrimental. It is irrelevant because it releases and promotes varieties that do not serve their priority needs and circumstances. It is detrimental because it undermines their local crop genetic dynamics, and it also threatens their economic security (for instance, the adoption of modern seeds tends to force farmers to permanently purchase new seed). In addition, the engineering of "nutritionally-rich" modern varieties often represents a bizarre and expensive scientific endeavour that ignores nutrition alternatives that are more ecologically, culturally and economically sound, such as enhanced use of local vegetable resources and improved agricultural diversification practices. These latter practices are more effective, affordable and considerate for smallholder farmers and poor rural communities.

Consequently, alternative seed supply systems are required to confront the shrinking of agricultural extension services, to launch economically sound strategies for seed security that suit poor households and particularly those affected by AIDS, and to foster sustainable livelihood approaches. These considerations challenge the formal seed sector to undergo a review and reformulation to better respond to the needs and circumstances of smallholder farmers and, in particular, to attend and enhance farmer seed systems.

### **Reconsidering farmer seed dynamics**

Farmer seed systems comprise a wide range of farmer and indigenous practices in seed selection, improvement, preservation, production and exchange. Farmer's knowledge, practices and values about local seeds are indispensable forces for seed security, yet they undergo neglect, continued erosion, and lack of technical and financial support. Farmer seed systems comprise profound knowledge about local cultivars, including agroecological features, such as drought resistance and labour requirements, and the use of genetic resources, such as food processing options and meal preparation.

Farmer seed systems are usually able to manage a rich portfolio of crop genetic resources, including both crop diversity and a vast cultivar diversity. This diversity responds to the agricultural, food and livelihood needs of most farmers, including farmers inhabiting harsh environments or heavily relying on subsistence agriculture. Farmers and communities, through the management of gene transfers in their agricultural systems, control in judicious ways the plant genetic resources that satisfy their food and livelihood needs (Senghor, 1999). Farmer seed selection, often conducted by women, represents a key practice for seed security. In addition, the conservation, access and use of farmer varieties provides agricultural, food and nutrition roles that are, however, absent or limited with the traits offered by modern varieties (box 34, and boxes 18-19 above in chapter 3).



Woman examining her traditional varieties of sorghum, which provide her more benefits than modern varieties deployed in the area (eastern Uganda) - see box 34.

### **Box 34. Examples of the roles of farmer seed dynamics in AIDS mitigation**

#### **Eastern Uganda**

In Busia area, modern sorghum varieties have been distributed and encouraged. However, farmers stress certain advantages of local varieties of sorghum compared to modern varieties. Such advantages are precisely of the highest relevance for poor and constrained farmers, such as particularly AIDS-affected households, as follows:

- a) Local varieties of sorghum can be "ratooned", whilst the modern varieties that have been released in the villages cannot. "Ratooning" is a farming practice consisting in cutting the stems at ground level just after harvesting so that the plant grows again and produces another crop without the need for seeding. This practice represents an enormous labour saving strategy, as land preparation and seeding activities are not required. In addition, it reduces the time needed for the following harvest and it economises seed inputs. These advantages in terms of labour saving, faster food provision, and economic security are particularly critical for AIDS-affected households and poor farmers. However, modern varieties, such as those developed in formal research centres and released in Busia area, impede this practice because, according to farmers, they cannot grow again from the roots.
- b) Farmers report that local varieties can be stored for a longer time than modern varieties. Storage is a critical need for both food and seed security, particularly among poor farmers. Food storage is a critical mid-term risk management strategy, especially when households are uncertain about their capacity to do adequate farming and harvesting in the following season.
- c) Farmers report that modern sorghum varieties are more susceptible to bird attacks than local varieties. Consequently, the presumed higher yield potential of modern varieties could be spoiled by the time of harvest, therefore questioning costly research and breeding activities.

#### **Central Tanzania**

In Iyumbo village, in Dodoma region, drought is a major agroecological constrain. Staple crops are traditionally pearl millet and sorghum. Maize is a minor crop, for which farmers have developed and maintain a few local varieties (such as *chipejere*), that are fairly adapted to drought. The Tanzanian government has for some time encouraged nation-wide maize as a basic crop to enhance both national food security and rural income. However, the improved varieties that agricultural programmes have deployed and encouraged in the area do not resist the drought levels of Dodoma, such as is the case for varieties 4142 and *ilonga*. These introduced varieties produce big cobs and provide high yields under good rainfall, but they fail in years affected by harsh drought, which are precisely the years prone to severe food insecurity in Dodoma villages. In addition, farmer varieties of maize are rather early maturing, thus providing food in a short period (about 2 months), which is a valuable feature when food reserves are depleted, as it often happens in AIDS affected households and among the poorest farmers. Moreover, the adoption of modern varieties forces farmers to purchase new seed almost every year, since the improved varieties are hybrid and composite seeds that degenerate after one or two successive croppings. Consequently, farmer seed saving is void. Many farmers state nowadays that they prefer their local varieties, but they now lack enough seed because the persistent promotion of modern varieties over the previous years has displaced local varieties and has even altered the genetic stability of the remaining farmer varieties.

*Source:* Field research in Tanzania and Uganda, 2001.

In addition, in vast remote areas of Sub-Saharan Africa, where large rural populations dwell, farmer seed dynamics are the only consolidated and reliable means for seed security. That is likely to continue in the near future. Accordingly, seed policy and programme support should primarily build on existing systems, so to be more effective. However, the limitations of farmer seed systems often serve as pretext for neglecting them, rather than exploring suitable initiatives that would channel scientific and technical support to improve them. The challenge ahead is, thus, to recognise and improve farmer seed systems in order to enhance, not undermine, farmers' abilities and practices on seed diversity and seed security. Initiatives around participatory plant breeding, farmer training in seed management, and close co-operation between formal and farmer seed systems represent promising ways ahead.

### **Grassroots efforts towards seed security**

The limitations and failures of formal seed systems, on the one hand, and the increased recognition of the value and potential of farmer seed dynamics, on the other, are inspiring renovated efforts for seed management and seed security with a grassroots approach, including both farmer-based and farmer-led initiatives.

The building of grassroots seed systems has been mostly activated through initiatives around participatory plant breeding (Eyzaguirre and Iwanaga, 1996; Friis-Hansen and Sthapit, 2000). These efforts foster the development of plant breeding through partnership between scientists and farmers, enhancing farmers' access to seed resources. Participatory plant breeding ranges from decentralised and grassroots-oriented breeding to various degrees of farmer involvement in crop conservation and breeding. It implies a transition from classical plant breeding, which focuses on high-yielding breeds of selected crops under favourable agroecological conditions, towards the context and needs of smallholder farmers.

In response to expanding seed insecurity, farmers themselves are also engaging in, or exploring a variety of community actions around seed resources, often in alliance with different organisations and projects. These grassroots efforts suggest good prospects for building more comprehensive community-based responses for seed security. In such initiatives, local seed systems and indigenous seed knowledge play a prominent role.

Seed fairs are a relevant grassroots activity for seed conservation, exchange and access. They evolve from informal seed exchange activities that farmers have been conducting since time immemorial, and can become an institutionalised mechanism for seed access at the grassroots level. Since 1997, rural seed fairs organised in different districts of southern Tanzania have proved successful in empowering farmers to address seed issues and to improve seed security (Synnevaag and Mkandawile, 2000). With the support of local agricultural services, national research centres and international organisations, rural seed fairs improve seed supplies to farmers through building up local seed systems. Rural seed fairs equally serve to generate awareness on seed issues, foster the exchange of seed resources, facilitate the transmission of indigenous seed knowledge, introduce gender approaches to seed security, and generate debate around strategies to improve farmer seed systems. Overall, rural seed fairs do not only improve seed security at the farmer level, but can also expand public awareness on the relevance of local seed systems and the need to explore alternative means to

improve seed security, including participatory strategies, gender approaches, and the effective integration of indigenous seed knowledge and practices.

In addition, farmer field schools represent a community-based agricultural forum that can provide farmers with renewed opportunities for seed security (field research, 2001). For instance, some farmer field schools in Busia district, in eastern Uganda, have set up on-farm multiplication plots to produce and distribute yam cuttings in their villages. They set up these seed production plots to facilitate local access to yam seedlings after the cassava mosaic virus devastated cassava production in the area. In addition, the farmer field school in Agoriata village has also established a commercial plot for sweet potato in order to raise income for the field school. This plot, which comprises over 5 local varieties and 3 improved varieties of sweet potato, also contributes to seed diversity conservation, experimentation, production and diffusion within the farmer group and the village.



Sweet potato field of a farmer field school, containing a diversity of varieties (Agoriata village, eastern Uganda)

Finally, seed security issues are becoming part of the agenda of the few AIDS-action organisations that are incipiently entering the agricultural domain. In this line, the

organisation Partage-Tanzania, which provides support for AIDS and war orphans in northwest Tanzania, has established about 15 demonstration farms with multiplication plots to improve seed access among the poorest farmers, especially households fostering AIDS orphans and rural women groups (field research, 2001). Consequently, AIDS-action organisations and projects are potential catalysers for seed access initiatives at the farmer level. In addition, the organisation THETA in Uganda, which supports traditional healthcare systems and medicinal plants as strategic action for HIV/AIDS healthcare responses, is exploring both seed policies and seedbanks initiatives on medicinal plants. Their demonstration herbal garden represents an innovative effort towards seed management on medicinal plants, which are important in combating major healthcare needs in Africa such as malaria and HIV/AIDS (see chapter 7, on medicinal plants, for further details).

These examples suggest the potential of grassroots efforts for seed security. The overall goal is to develop farmer seed systems and farmer seed autonomy through the mobilisation of all possible resources and knowledge, both indigenous and modern.

### **Community seed systems**

The expanding seed insecurity in rural communities demands concerted responses, the cooperation between formal agricultural services and farmer organisations, and the integration between indigenous seed knowledge and modern seed science. In this sense, the development of community seed systems represents a key grassroots strategy for seed security, particularly for poor peasants and communities prone to seed insecurity. The goal of building community seed systems is to empower farmers in seed security through strengthening their local seed dynamics and enhancing the cooperation between farmer and formal seed systems.

Community seed systems represent farmer and community efforts dealing with conservation, experimentation, improvement, production and distribution of seed resources. Farmer seed dynamics (also called informal or local seed systems) are primary components for community seed systems, including their associated genetic diversity, indigenous seed knowledge, and farmer seed practices. They need support and strengthening through adequate knowledge, practices and technologies drawn from formal seed systems (Almekinders and Louwaars, 2000). These community seed strategies empower smallholder farmers in seed security, addressing aspects such as conservation, characterisation, selection, breeding, production, exchange and distribution of crop genetic resources. Building community seed systems entails the following processes:

- a) focus on community seed security, placing emphasis on the poorest and most vulnerable households;
- b) participation of farmers in seed security strategies;
- c) promotion and improvement of indigenous seed knowledge and practices; and
- d) equitable and participatory relationships between the formal seed sector and smallholder farmers.

Community seed systems comprise the wide range of initiatives, instruments and practices, conducted at the farmer grassroots level, that contribute to community seed security (box 35).

For instance, community seedbanks represent an initiative with growing prospects for strengthening farmer capacities in the conservation and management of a diversified portfolio of genetic resources. They have proved a successful and multipurpose strategy for seed security in the developing world, yet they have been the least experimented and implemented in Sub-Saharan Africa. Furthermore, rural seed fairs allow cross-community exchange of seeds and the associated seed knowledge. In general, the options for community seed systems are wide and varied, depending on local seed conditions and constraints, crop diversity, extent of indigenous seed knowledge, contribution of the formal seed sector, available support capacities, and imaginative programme support, among other factors.

### **Box 35. Suggested initiatives for community seed systems**

- Community seedbanks
- Rural seed fairs
- On-farm seed multiplication plots
- Participatory plant breeding, including farmer-based and farmer-led initiatives for crop varietal selection, research and development
- Promotion and improvement of indigenous seed preservation practices
- Community seed exchange and supply mechanisms
- Farmer field days
- Community seed solidarity funds
- Community seed stocks
- Community seed diversity registers
- Small-scale seed storage infrastructure
- Farmer seed networks and associations
- Partnerships and co-operation between the formal seed sector and rural community organisations
- Community committees of seed experts
- Participatory seed policy-making
- Community-based seed emergency and rehabilitation networks
- Farmer seed training programmes
- On-farm seed production and commercialisation
- Appropriate seed technology transfer
- Seed modules in rural education programmes
- Community agrobiodiversity committees and organisations

*Source:* Personal compilation.

Building community seed systems requires concerted action from different seed sectors, including agricultural extension services, seed projects, seed policy-making, and the formal seed sector. In particular, support and co-operation from the formal seed sector is indispensable to improve farmer seed practices and crop genetic resources. In this sense, community seed systems represent an alternative force for seed security where farmers, scientists, national agricultural agencies, international organisations, and even the private sector are all called upon.

Community seed systems also represent grassroots spaces to overcome futile controversies between farmer and modern seed dynamics. They dilute dichotomies such as traditional

varieties *versus* modern bred lines, conservation of farmer landraces *versus* modern breeding, and farmer knowledge *versus* seed technologies.

If appropriately designed, community seed systems can serve a wide range of inter-related purposes, such as: (a) expanding seed access to poor and seed-insecure farmers in the community, (b) strengthening farmer capacity to conserve and use local agrobiodiversity, (c) empowering farmers to understand and confront seed issues, (d) fostering participatory analysis in the adoption of modern varieties, (e) creating social mechanisms for integrating the most marginalised farmers in community seed dynamics, and (f) generating grassroots spaces for discussion over seed and seed security issues. For instance, community seed systems empower farmers to address the erratic arrival of modern improved varieties with adequate consideration about agrobiodiversity and farmer-based seed security. They equally provide options to address the expansion of genetically-modified seeds, allowing farmers to access information, raise awareness, and deploy instruments of control. Finally, community seed systems represent a farmer space for learning and exchanging experiences about seed security.

## Seed relief

Seed security action demands a review of seed relief, especially as agricultural and humanitarian emergencies expand in Africa and require seed relief efforts (Garí 2001b). In addition, the scale of HIV/AIDS impact is likely to demand targeted seed assistance due to the strong correlation between AIDS impact and seed insecurity. The interface between HIV/AIDS and seed relief raises specific concerns and demand appropriate practices (box 36). Furthermore, local seed resources and indigenous seed knowledge deserve full recognition and integration in seed relief interventions (box 37). In essence, seed relief should not consist in flooding villages with seeds, but restoring farmer seed systems and farmer seed autonomy with due regard to the environmental, socio-economic, and cultural conditions.

### **Box 36. Agricultural emergencies and seed relief in the context of HIV/AIDS**

Seed relief is a central component in agricultural emergency interventions, since it represents the primary basis for agricultural rehabilitation. In the context of AIDS, emergency action requires the design and deployment of seed relief in accordance with the needs of AIDS-affected households. Relevant practices comprise as follows:

- Promoting non-labour intensive crops to help coping with AIDS-related labour shortages.
- Providing seed relief for a diversified set of crops in order to support household nutrition and restore the specific agricultural practices of women, among other benefits.
- Providing a diversity of seed resources that can assist every AIDS-affected household to plan an agricultural system that better suits their needs and possibilities, helping them to balance labour, agroecological management, income, and nutrition, among others.
- Promoting seed varieties that enable low-input agricultural systems, so to safeguard the household economy and help AIDS-affected households to better absorb the economic burden owing to HIV/AIDS.
- Conduct seed relief that is ecologically and culturally sensitive, conforming to the indigenous knowledge systems, farmer seed systems and local food habits. This practice will optimise agricultural rehabilitation, as AIDS-affected households need access to seeds that they know and trust.
- Deploying a seed relief combination that aims at rebuilding farmer seed systems, including components for creating community-based seed systems.

Another consideration around seed relief in the context of HIV/AIDS is related to the need of strengthening farmer seed dynamics. In development practice there is an extended belief that the more complex a problem is, the more sophisticated the solution should be. In the seed sector, this legitimates the systematic deployment of modern seed types, even most recently genetically-modified seeds. These modern seeds are supposedly superior to local ones and are encouraged as a means to overcome labour shortages, productivity limits, drought and other constraints. Indigenous and local seed types are disregarded as "useless" to meet the needs of poor rural people, and increasingly displaced as result of modern development discourses and emergency interventions. However, neither modern varieties constitute an agricultural miracle, nor traditional varieties are hopeless residues from the past. In fact, small-scale farmers have for decades managed their crop genetic resources to meet their circumstances and needs, with notable success as demonstrated by their rich crop genetic diversity and their success to develop agriculture in the most extreme conditions. Accordingly, there is an urgent need to design and deploy seed relief in ways that truly restore farmer seed systems and farmer seed autonomy.

In essence, households suffering emergencies, HIV/AIDS and other difficult conditions need first and foremost that their customary seeds and seed dynamics are restored and functioning again, rather than "experimenting" with new or exogenous genetic resources. This is an urgent need, yet often ignored or poorly attended.

*Source: (Garí, 2001b)*

### Box 37. Ecologically and culturally appropriate seed relief

#### Analysis of seed relief in Aga-Terke village (Gulomahda), Ethiopia

In the village of Aga-Terke, and in surrounding areas of Martha P.A., in Eastern Tigray (Ethiopia), farmers cultivate two main local varieties of wheat: *teselemo* [black] and *shahan* [white]. *Teselemo* is an early-maturing variety (circa 3 months) that is resistant to drought, poor soils, and some local diseases. *Shahan* is less resistant to agroecological constraints but, under favourable climatic conditions, can provide a higher yield, aside from having excellent properties for making bread.

As result of war in the late 1990s, wheat seed relief in this village consisted basically in the supply of the variety HAR-1685, which is a high-yielding variety (HYV) developed by the formal crop breeding sector. Governmental regulations and, in some cases, unavailable local seeds in the markets encouraged the distribution of this high-yielding variety to the detriment of farmers seed types.

Farmers in Aga-Terke lack both knowledge and custom around the distributed HAR-1685 variety. In addition, this modern variety requires the use of chemicals to ensure growth. Although conventional agronomists may regard HAR-1685 as an advanced wheat variety for increasing wheat productivity, farmers have to deal with an alien variety that is at odds with their agricultural dynamic and may render them more vulnerability. In particular, this modern variety entails the following paradoxes:

- It is not connected to the farmers' agroecological systems and practices.
- As a high-yielding variety, it is highly dependent on chemical inputs (e.g. fertilisers, pesticides), which may generate a vicious debit and impoverishment circle among poor farmers.
- It is likely to be more vulnerable to adverse local agroecological conditions, so that farmers may suffer increased food insecurity.
- Its high-yielding potential is probably dependent on depleting soil nutrients, thus undermining the prospects of agricultural sustainability and long-term food security, particularly in arid lands and poor soils such as in the highlands of northern Ethiopia.
- As the case for many high-yielding varieties, its yield potential will start declining after a few cropping seasons owing to genetic segregation, thus forcing farmers to purchase seed again, incurring in further expenses and loosing their seed autonomy.

Farmers of Aga-Terke, when asked about which type of seed relief they would prefer, tended to say that they would like to receive seed of the three mentioned wheat varieties: their two native varieties (to reconstruct their seed system) and the improved variety ("to experiment it"). However, when requested which variety they would choose if seed relief was limited, farmers tended to say that they preferred the *teselemo* variety because they know it is resistant to the local agroecological constraints (mainly drought and poor soils) and, thus, it is more reliable in providing a minimum amount of wheat grain for the family.

This case illustrates that understanding, respecting, and supporting farmers' rationale, concerns and needs is highly relevant for a successful agricultural rehabilitation process. This is more critical in the context of HIV/AIDS, as households suffer heavy and manifold constraints in their labour, agricultural, economic, and food security systems. Enhancing farmers' autonomy in seed access is essential for the recovery process.

In other areas of Ethiopia, seed relief comprised an organised seed market, which allowed farmers to purchase seeds according to their criteria and needs, and therefore plan a tailored agricultural rehabilitation. Accordingly, farmer-based seed relief systems, such as distribution of seed vouchers and organisation of local seed fairs, would prove particularly valuable in the context of HIV/AIDS, yet they are not still the norm in seed relief. They would strengthen the autonomy of every household to plan a tailored agriculture and rehabilitation process according to their specific needs, constraints and priorities, with due regard to their specific agroecological conditions, labour availability, nutritional needs, and food security concerns.

Overall, seed relief systems that support, rather than undermine, customary seed systems and farmers' decision-making are fundamental in the context of HIV/AIDS. They are more likely to enhance the autonomy and capacity of poor households to develop coping strategies tailored to their specific conditions.

*Source:* Extracted from Garí (2001b: figure 8), based on field research in East Trigray, Ethiopia, September 2001.

*Picture:* Farmer with local wheat variety *teselemo* in East Tigray (Ethiopia).



## **Concluding remarks**

At the seed insecurity impasse, community seed systems represent affordable, effective and sound responses for seed security at the farmer level. They bring tangible benefits and opportunities to the seed security needs of the poorest and most vulnerable rural households. In fact, the rural poor often lack resilient seed systems to ensure affordable and sustained access to the seed diversity required to meet their specific agroecological, nutritional and livelihood needs. Building community seed systems represents a valuable strategy to empower the rural grassroots in seed security through catalysing the conservation, use, improvement, exchange and diffusion of crop genetic resources in the communities.

In conclusion, community seed systems comprise a wide range of potential initiatives that empower farmers in seed management. They create new spaces and opportunities for the interaction between different seed stakeholders, including farmers, scientists, agricultural institutions, the formal seed sector, and rural development projects. The goal is to strengthen local seed systems through the integration of seed knowledge, appropriate technology transfer, and efforts oriented to community participation.