



Technical Note #67

Farmers' Seed Fairs

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Seeds and other planting material on display at a seed fair in Natikiri, Nampula, Mozambique

INTRODUCTION

Often farmers asked for seed, but we weren't quite sure what to expect when we suggested—to the farmers' union in Nampula, Mozambique—that they organize a fair in which the members could come together and exchange seed. They might only be interested in “improved” varieties.

However, when we arrived at the place the fair was to be held, it was clear that the farmers had picked up the idea. They had constructed temporary shades with grass roofing and the scene was bustling with activity. Songs, dances and other activities were performed. Many seeds were on display on the reed mats—many more than what farmers usually say they produce when asked what they grow (maize, cassava, cowpeas, peanuts and rice). Virtually all material was exchanged.

Since the beginning of agriculture, humans have been spreading seeds and other planting material with the purpose of improving productivity of native varieties or introducing new crops. Wars and conquests led to new foods and species being introduced in conquered places (for example buckwheat came from China to Europe with Djengis Khan's army). Conquerors returned home with exotic species and foods.

Where climatic conditions allowed them to grow, edible species spread. Today a number of global crops exist far from their zone of origin, such as corn, potato, soja, wheat, tomato, rice and cassava.

Historically, the market provided farmers with those seeds they didn't have because of unproductive crops, plagues or natural disasters. Farmers also looked in markets for seeds that were better appreciated, for taste or production traits, than the ones they were already cultivating.

Seed fairs, with methodical planning and careful selection of participants, create even greater potential than traditional markets for seed exchange to occur. Seed fairs have gained popularity and are being organized in Latin America, Africa and Asia. Mostly the organizers of the fairs are concerned about farmers' lack of access to seed and about loss of on-farm diversity.

Generally speaking, seed fairs try to meet one or more of the following objectives:

- Improve (timely) access to seed for farmers;
- Contribute to conserving and managing plant genetic resources and maintain or improve agrobiodiversity;
- Raise awareness of the importance of biodiversity and Plant Genetic Resources;
- Strengthen the position of (small scale) farmers and their communities within the agricultural complex.

In order to analyse the potential and diversity of seed fairs, and to identify potential pitfalls, we will discuss seed fairs within the context of seed development and genetic diversity.

THE IMPORTANCE OF SEEDS

We need seed to guarantee our food for tomorrow. However, whether a seed will produce a crop or not depends on many different things: there should be water (not too much and not too little); light and warmth (not too much and not too little); 3) nutrients available; and 4) soil that is not too acid nor too salty. The time of planting should be right and pests and diseases should not destroy the plant etc. What is too much and what is too little depends on each seed. Farming is basically trying to balance all these factors. And as no crop cycle is the same, we need a large number of seeds with different characteristics in order to guarantee a minimum of (food) production.

After harvesting we still demand more. We have preferences for taste, texture, color and cooking qualities of crops, and we want to be able to store and process our harvest. Farmers keep all these preferences in mind when selecting seed for the next crop. All these requirements are stored in our seeds, which were domesticated from wild species over the centuries.

The importance of genetic diversity

With unpredictable and varied growing conditions from one year to another, there is no such thing as a perfect seed for one site, let alone for a variety of different locations. In order to at least produce something in any potentially occurring condition, our ancestor farmers developed and maintained different varieties. Some perform better in dry conditions, others in wet conditions, and yet others are better resistant against a particular virus or bacteria (and so on).

High genetic diversity is necessary for a crop to be stable over time. The importance of genetic diversity may best be illustrated by events that have resulted from its lack—like the Irish potato famine, the corn blight crisis in the USA in 1970 or more recently the problems with diseases in banana. In all the above cases, the root cause of each crisis was fatal uniformity of the genetic material, making the crop extremely vulnerable to diseases.

So-called 'modernization' in agriculture, which started in the late nineteenth century and which accelerated enormously since the onset of the green revolution, is the main force behind the great loss in the diversity of plant genetic resources. With the promotion and adoption of modern varieties, landraces are disappearing in farmers' fields at a rather alarming rate (Mooney 1990). The losses are being reinforced by the ubiquitous promotion and subsidizing of chemical fertilizers and pesticides, encouraging farmers to abandon ecological rationality and adapt a market-oriented rationale. Rapid changes in the environment (habitat loss and changes in climate) further compound this situation.

How serious are the losses? Again, who can say? We do not know the characteristics of varieties now extinct. But we remember the sobering story of a wheat race collected in 1948 by Jack Harlan in Turkey. Arriving in the U.S., it was given the plant introduction number 178383. No name was deemed necessary. Harlan described it thusly:

It is a miserable-looking wheat, tall, thin-stemmed, lodges badly, is susceptible to leaf rust, lacks winter hardiness . . . and has poor baking qualities. Understandably, no one paid any attention to it for some 15 years. Suddenly, stripe rust became serious in the northwestern states and P.I. 178383 turned out to be resistant to four races of stripe rust, 35 races of common bunt, ten races of dwarf bunt and to have good tolerance to flag smut and snow mould.

Harlan's miserable wheat is now used in all breeding programs in the northwestern states of the U.S. and saves farmers millions of dollars each year. Can we safely lose thousands of varieties of wheat today with the assurance that we will not need them in the future?

Mooney (1990), *The Threatened Gene*

The encroachment of modern varieties is less in more challenging environments (like mountainous areas or areas with harsh conditions) compared to lowlands and more moderate climate zones.

Genetic diversity is crucial, as is the conservation of this diversity. With the growing loss of local varieties, we stand to lose the genes that allow us to better adapt to environmental changes, social challenges (like hunger) and even human diseases.

At the level of the agriculture ecosystem of small-scale producers, adaptability is a very important ecological attribute. Farmers demonstrate adaptability in the wealth of different seeds that they manage in their productive systems, and in the genetic heterogeneity present in each variety. As a result, farmers' systems show a high degree of resilience and ecological stability in the face of challenges such as climatic changes, the appearance of plagues and natural disasters.

In essence, we can say that the seed saves valuable information, which small-scale agro-ecosystems of family farmers utilize to keep their enterprise sustainable. As such, family farmers conserve a much greater biodiversity than the genetically homogeneous modern systems of the green revolution and corporate agriculture.

Losing more than Plant Genetic Resources (PGR)

The loss of PGR and biodiversity in itself is very serious, but we are losing more than just genes.

Seeds are constantly renewing themselves and, in the process, certain characteristics may appear or disappear, so they need to be managed. This means that the most useful seeds (depending on the needs of the user, whether farmer or plant breeder) are kept for future use. In a way, the seeds being used by a community are a reflection of that community's history and culture. By maintaining crop diversity and actually experimenting and developing new varieties, farmers are de facto conserving biodiversity. With the loss of seeds, this knowledge and the culture in which that knowledge is embedded are also being lost.

Modernization has not only introduced new seeds but also a new farming model whereby the intricate knowledge of farmers, with their seed selection and improvement methods, becomes obsolete and is lost. Farmers become increasingly dependent on breeding institutions and companies for their seed and on extensionists for advice on the use of seed and of the chemical inputs necessary for successful growing of the seed (Keep in mind that the performance of modern or improved varieties is directly linked to the use of chemical fertilizers and pesticides).

Genetically Modified Organisms (GMOs) are the ultimate symbol of scientific advance in the field of the improvement of seeds. However, rural systems can suffer many negative impacts from this advance. With the introduction of GMOs, local seed systems are damaged by degrading the local varieties. This introduction can also result in elimination of the internal mechanisms of knowledge transfer among the farmers, who must then depend on the external knowledge of technicians.

WHY WOULD FARMERS LOOK FOR SEED?

Farmers look for seed for several different reasons. First, peasants look for seeds they used to have but lost for some reason. One such reason, for instance, can be poor production, which obliged the family to eat or sell what they saved. For certain crops (maize for instance), modern varieties are more difficult to conserve. In Mozambique for example, in local varieties of maize, the grains have a harder skin and have far less problems with post-harvest losses than the modern varieties like the Matuba variety. In such cases, farmers often opt to sell (or eat) before losing the crop. It should also be noted that, by definition, landraces are well-adapted to the local environment. Thus, it can be expected that modern varieties are more easily lost by farmers than landraces.

Second, farmers constantly look for seeds with certain characteristics (e.g. early maturing, good taste or disease resistance) that they can integrate into their farming system to improve their production in terms of security, quality or quantity. A certain level of genetic diversity is maintained in local varieties. For example,

uniformity (a desirable trait for mechanized farming and for plant breeders wanting to identify their varieties) is not really relevant for a crop that will not be harvested mechanically. Genetic diversity is important to avoid major epidemics of diseases and pests (among other reasons), Climate change, and the more extreme weather patterns that result, might challenge production systems. As a result, farmers are challenged to respond by adapting their production system and thus their seed.

Third, often farmers are curious. They may not necessarily set out to acquire a new variety, but might encounter planting material that catches their interest, in a similar way as consumers that go to a shopping mall might come home with unplanned purchases.

Farmers also acquire different varieties in order to deliberately experiment and improve their seed stock (see for example Van der Ploeg, 1993, on Peruvian farmers in the Andes). They manage diversity, and carefully select and subsequently integrate newly generated seed into their system. As mentioned, the loss of genetic diversity and the encroachment of modern varieties results in the loss of specific farmers' knowledge and skills.

Farmers' exchange, selection and breeding activities are in danger of being pushed into illegality, as is already the case in Europe. Commercial companies are taking an increasing role in plant breeding and seed production in developed countries, supported by the so-called Plant Breeders' Rights (PBR) and (in the case of GMOs) with the much more restrictive Intellectual Property Rights protection (See for example the case of Association Kokopelli, www.kokopelli.asso.fr)

WHERE DO FARMERS GET THEIR SEED?

Basically, farmers acquire their seeds (and other planting material) in three ways: 1) they produce seeds themselves; 2) they barter, exchange or borrow with other farmers; or 3) they buy seeds in the market. These days, a fourth way is through extension agencies and companies that "freely" distribute seed, promoting "improved" varieties or certain crops like cotton or potato. In developing countries most seed is produced by farmers themselves, rather than by plant breeders.



Looking for seeds and, at the same time, exchanging experiences and ideas (Natikiri, Nampula, Mozambique Oct 2008)

Even in a country like Cuba, where until the early nineties the focus was on large-scale high-input/ high-output farming, an informal seed system, operated directly by and for farmers, continues to exist. The maintenance of wide variability and adaptation is traditionally carried out in small plots where farmers conserve in vivo those plants considered useful to the household. Through the informal system, the production of seeds of the basic staples of the Cuban diet has continued in many parts of the country. These genetic resources have provided a basis for plant breeders selecting commercial genotypes.

Rios and Wright (1999)

Small-scale farmers in developing countries do not restrict themselves to seeds from one source, and often they use both local varieties (or landraces) and seeds originating from the institutional plant breeding system. What seed they use depends on the crop, use of the seed (e.g. for sale or for home consumption), availability (often markets do not have the required seeds at the right time) and accessibility (farmers often consider seed produced by the commercial system expensive).

TWO APPROACHES TO PLANT BREEDING

Crop characteristics constantly change due to cross-pollination. Therefore seeds need to be managed through plant breeding activities to maintain or acquire desired traits. Generally speaking, there are two approaches to plant breeding.

Modern plant breeding presumes that a farmer is more or less able to control all the different crop requirements. Furthermore, generally speaking, the breeding focuses on one single objective, most often yield maximization. It thus presumes that whatever the plant requires can be catered for via, for example, irrigation and drainage, fertilizers, pesticides, greenhouses etc. It is also frequently presumed that farmers have the means to invest in all these inputs before growing a crop.

The conventional plant breeding approach is based on developments in industrial countries and addresses relatively uniform environments and market-oriented agriculture. The main objectives are maximization of yield and broad adaptability. Seeds produced in this way, however, don't come cheap. In order to recover the investment needed to produce a new variety, the seed needs to be cultivated on large areas of land (at least 100, 000 ha according to Hardon, 2004). Furthermore, in order to be able to determine a specific crop identity, genetically uniform varieties are required, not for agricultural reasons, but to be able to define the seed's identity in comparison with other varieties.

In contrast, most of the seed in developing countries is produced by small-scale farmers. Their approach is different from plant breeders. Farmers accept the ever-changing conditions as a given and aim to manage the insecurities by maintaining diversity (among and within crops). For small-scale farmers, the priority objective is much more to avoid unnecessary risks and improve yield security over time rather than to maximize yields immediately.

Farmers [commenting on seed fairs in Tanzania] emphasized that more efforts should be directed towards local crop landraces that thrive well in semi-arid conditions, without forgetting those collected crops that are particularly important during harsh weather (FAO, 2006)

The way farmers breed their crops is also different. The breeding process, rather than being strictly controlled, deliberately allows cross pollination from neighbouring fields or from wild varieties to occur.

Farmers approach their crop in the context of their livelihood, and thus many characteristics are important—rather than just the yield of a particular crop. For example, they actually eat what they produce, so taste is also highly relevant. Selection and breeding thus becomes a juggling act between many interdependent factors. These are just a few: pest resistance; labor requirement; secondary yields (like leaves for food or fodder); how easy the crop is to conserve; drought resistance; sensitivity to water logging; early vs. late maturation; taste; production in poor soils without fertilizer; and capacity to withstand strong winds. To illustrate this point a Mozambican commented, after visiting an exhibition in Brazil on the different uses of cassava, that she was really impressed by all the different ways cassava was used and processed, but at the same time surprised that apparently in Brazil they don't eat the cassava leaves (whereas in Mozambique leaves are used for preparing a dish called Mathapa or M'boa) (personal communication Leopoldina Dias 2005).

Farmer Varieties	Modern Varieties
genetically heterogeneous	genetically homogeneous
local adaptation	broad adaptability
diverse characteristics	yield maximization

Hardon, 2004

The type of seeds resulting from the two approaches can be broadly described as follows:

For many communities, seed traditionally represents much more than a means to produce a crop, and using seed to make money or recover costs is unheard of. Traditionally, seeds are for sharing, not for sale.

According to Hardon (2004 and 2009), plant breeders are increasingly aware that breeding primarily for increased yields in more favorable environments has led to associated problems. To name a few:

- An increased inequality between wealthier and small-scale resource-poor farmers;
- New pest and disease problems due to genetic uniformity;
- Huge losses of PGR;
- Insufficient attention to culturally determined preferences.

As a result, since the 1990s, Participatory Plant Breeding (PPB) and Participatory Variety Selection (PVS) have become more popular (Note, however, that participation can have many different meanings—from asking opinions to actually having farmers leading the selection and/or breeding process). PPB and PVS have been especially used as a crop improvement strategy (but not exclusively) in response to the need for impact in non-commercial crops and in very unpredictable, stressed production environments (Sperling *et al.*, 2001). PPB and PVS activities have been successful according to quite a few documented cases, thereby confirming farmers' skills and capacity in plant selection, breeding and management (see for example SEARICE, Proceedings of the International Workshop on Participatory Plant Breeding Valuation, 2007). Apart from the "technical" advantages of developing varieties better adapted to farmers' needs and skills, farmers following the PPB approach are much faster than traditional plant breeding institutions in developing new lines/seeds [as clearly shown in the Community Biodiversity Development and Conservation (CBDC) and Biodiversity Use and Conservation in Asia Programme (BUCAP) experiences in all 5 countries (Bhutan, Vietnam, Laos, Thailand and Philippines) where the program is implemented, as well as in the seed project of the Association des Organisations Professionnelles Paysannes (AOPP) in Mali] (Noray and Coulibaly, 2009). In the context of rapidly changing weather patterns, an argument can easily be made for relying increasingly on farmers' capacities and less on centralized institutions.

According to Ignacio Nori, Regional Program Coordinator for SEARICE (personal communication, 2010), complementary work is actually the most ideal, where plant breeding institutions generate and distribute pre-breeding materials to farmers based on the breeding objectives of farmers, while farmers do the selection from early-generation materials. A big problem is that plant breeding institutions usually do not want to release segregating materials (seeds that plant breeders start with in the process of developing new lines/varieties of seeds) to farmers. This is partly due to a lack of awareness as to the capacity of farmers to do plant breeding and selection. It is also due in part to Intellectual Property Right (IPR) laws, where ownership of new varieties is used as incentive for research and varietal development.

Seeds as part of an agricultural system

For an enhanced understanding of farmers' behavior, consider their use of seeds as part of an agricultural system with many interrelated components. To assess the economic vulnerability of such a system, one should analyze the risk and uncertainty within the system components.

According to Fraser, Mabee and Figge (cited by Vander Vennet, 2010) the vulnerability of a system is largely determined by three factors:

- The wealth of a system (The bigger the wealth the more buffer capacity is available to cushion shocks to the system);
- Ability to control or influence external forces;
- Diversity of the system.

In assessing the vulnerability of small-scale farming systems, it becomes clear that the conventional plant breeding approach, with its tendency to uniformity, economy of scales and dependency on external (chemical) inputs, in most cases increases economic vulnerability by increasing the dependence on external forces without any leverage in controlling these forces, while at the same time reducing the diversity of the system. As small-scale farmers already start from a relatively poor system, the economic sustainability of the system can be seriously undermined by an increasing reliance on modern varieties.

SEED FAIRS

Seed fairs have gained popularity and are being organized in Latin America, Africa and Asia. Generally speaking, there are two types of seed fairs. A first type is mainly concerned with conserving agro-biodiversity and promoting landraces. This type came about as a response to the loss of diversity and the realization that modern varieties are not adapted to the farming systems of small scale farmers.



A second type emerged as an attempt to provide alternative seed options (other than handouts) to farmers affected by devastating crop losses. This second type of fair usually makes use of a voucher system to allow even the poorest farmers access to seed.

In general, as mentioned earlier, seed fairs are conducted to meet one or more of the following objectives:

- Improve timely access to seed for farmers;
- Contribute to conserving and managing plant genetic resources and maintain or improve agrobiodiversity;
- Raise awareness of the importance of biodiversity and PGR;
- Strengthen the position of (small-scale) farmers and their communities within the agricultural complex.

One of the central assumptions regarding seed fairs is that, by growing their diverse crops, farmers are in fact actively conserving both diversity and the specific knowledge required for appreciating and maintaining that diversity. Diversity needs to be applied to be useful. If the wealth of seed diversity were to be confined to seed banks only, it would be of little use.

By creating a special occasion (i.e. the seed fair), farmers' access to each others' seed is facilitated. At the same time, an event dedicated to seeds and displaying the wealth of seed diversity contributes to a greater awareness of the importance of diverse plant genetic resources (PGR). Last but not least, seed fairs bring different stakeholders in PGR together.

Whether these objectives are achieved, however, depends on how the fair is organized. Consequently, the following aspects need to be considered when organizing a seed fair.

Participants

As FAO (2006) observes: *“Unlike more formal agricultural fairs, which farmers attend as passive spectators of others' materials and technology, a seed diversity fair gives farmers the opportunity of meeting to discuss and demonstrate not only their own seeds, but also their local practices and knowledge that are linked to specific seed varieties, storage methods, processing techniques and use.”*

However, this is not necessarily the case in every instance. Success depends on who is participating in the seed fair and how the seed fair is organized.

Participants in a seed fair vary. Often, organizations and institutions concerned about loss of PGR are involved in the organization of seed fairs. This means that, in addition to farmers' families, scientists (breeders, agronomists) and extensionists participate too. Traders and seed companies are sometimes also invited.

Farmers

Farmers should participate, but which farmers? This depends on a number of issues.

Not all farmers can participate at a fair. Thus, participants have to be selected though there are curious community members, who may show up at the fair ground. Selection of the participants can help promote the quality and diversity displayed at the fair. In selecting farmers, try to ensure that each participating farmer represents a group of farmers. This will help maximize the outreach and impact of the fair, and will also ensure that a wide diversity of seeds are presented (farmers representing other farmers are more likely to bring seeds other than just their own to the fair).

A selection process, when based on previously established criteria (like the role of a farmer in the community, the number of different varieties a farmer plants, etc), can also serve as a way to improve democratic mechanisms and transparency within farmers' communities and organizations, and can reflect the importance of seed and biodiversity for farmers.

Make sure you guarantee, through the selection process, the participation of women. If no active steps are taken to facilitate and promote the participation of women, it is often the men of the community who will dominate events organized by outsiders. For seed fairs, this would mean a lost opportunity for several reasons. In many societies, for instance, women are actually the main farmers. Moreover, the diversity of offerings in a seed fair could be reduced if women are not invited to participate. In some societies, women and men traditionally are responsible for different crops (Smith, 1996). For example, agricultural production among the Soninke in western Africa was traditionally crop specific according to gender. Women cultivated rice, indigo, cotton, and groundnuts, while men grew millet, sorghum, maize, and tobacco (Pollet and Winter, 1978; Weigel, 1980; Smith, J. 1996). In other societies, women are responsible for the selection and



Women are important participants at seed fairs (Natikiri, Nampula)

conservation of seeds (Martínez and Bakker, 2006). Men are often responsible for the marketing and the family cash crops. As a result, the men may be more oriented towards modern varieties, cultivate fewer landraces and generally contribute less seed diversity to seed fairs than women.

Regardless of the gender of participants, knowledge of crop varieties within a community is important. FAO (2006) reported that “a surprising number of farmers often know very little about the different crop varieties that are being used by other farmers living in the same rural community. Research greatly increases farmers’ and researchers’ awareness of crop diversity within rural communities, and there is a need to strengthen this process further through the use of community events. Seed fairs are a good way of achieving this.”



In some instances, it might be helpful to include farmers from outside the local community. For example, a farmers’ union in Mozambique felt that the seed fairs held at a community level were of little interest because most people brought the same seed (varieties). To tackle this problem, the farmers’ union devised a scheme whereby farmers from different regions participated at the same fair. This effectively increased the seed offerings as well as the diversity and exchange (Bakker and Martínez, 2009).

The Mozambican experience seems to be confirmed by that of the International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT) in Zimbabwe: At a seed fair where modern varieties were offered and seed vouchers were distributed, ICRISAT noted:

Participating farmers recognized that they could still obtain seed of many local varieties outside the fair. But high-quality [modern varieties] maize seed was harder to find. Farmers wanted to purchase commercial maize seed and complained about the limited choice of commercial varieties on offer. In contrast to NGO assumptions, many sought hybrid maize seed instead of the open-pollinated seed offered by traders linked with specific NGOs. (Rohrbach and Mazvimavi, 2006)

In general, bringing farmers together from different regions to a seed fair helps to increase the diversity, not only of seeds, but also of experiences with crops (e.g. ways and timing of planting) and thus facilitates richer exchanges among participants.

Children and students

Seed fair organizers in Cuba, from Instituto Nacional de Ciencias Agrícolas (INCA), realized that when you organize a seed fair as a community activity (in which you aim for the participation of men and women), consideration should be given to the children (Dueñas et al. 2005). Otherwise, women are less likely to be present and to actively participate because, in most cases, they are held responsible for taking care of the children. Once the researchers realized the importance of children, they saw the seed fair as an opportunity to raise awareness and educate children on issues such as love for nature, diversity, protection of PGR, importance of healthy food and other issues directly related to the communities where they live. At the same time, planning activities for the children allowed the parents to conduct their own business at the fair.

Consciously including the children of peasants or school students changes the dynamic of seed fairs. While adults might focus on acquiring certain seeds, the activities targeting the children are more educational and formative.

The main objectives when working with youngsters are:

- To sensitize and to appreciate agricultural diversity of the rural community and ways of protecting this diversity;
- To conserve rural traditions and to strengthen the rural identity of the children and youths to avoid their future emigration to other places;
- To enrich the alimentary culture by introducing the consumption of vegetables, fruits and grains of local production; and
- To link the school and the students to the environmental actions of the community.

Work with children and adolescents can be carried out in different ways. For example, in Cuba (Dueñas et al. 2005), facilitators that were trained in participatory techniques conducted specific workshops with youth groups. The activities included traditional games, participatory dynamics and techniques for reflection and development of knowledge about agro-diversity and the importance of vegetables for a healthy diet.



Students participating at a seed fair in the Mekong Delta at Can Thó University, Vietnam

In the CBDC-BUCAP project (in Bhutan, Thailand, Laos, Vietnam and Philippines), diversity seed fairs were organized within a wider context in which teachers in rural areas were encouraged to systematically include activities for students that highlighted the importance of crop diversity and of the maintenance of these native/indigenous varieties in local production. In Thailand and in the Mekong Delta, students (school children or college students) participate as the key actors in organizing seed/biodiversity fairs. Such participation is usually part of the learning requirements for courses on PGR conservation and development.

When developing activities targeted towards children, time events so that you can make use of the knowledge generated at the fair's activities. To this end, aim to develop close relations between the organizers of the fairs, the educational centers of the town, the community organizations and also individuals including researchers, local extension agents, government officials, etc.

Scientists and researchers

The presence of scientists can positively and/or negatively contribute to a seed fair. A lot depends on the attitude of the scientists.

Often scientists and extensionists have a tendency (and are expected) to explain to farmers how things should be done. Frequently, scientists to come to a community event armed with information and materials to provide (what according to them should be) the solution to a problem.

If scientists taking part in a seed fair do not recognize the value of small-farmer systems, they will typically collect material from farmers and at the same time distribute the "improved" varieties they developed at their institutions. This only reinforces the vertical relationship between scientists and farmers and does nothing to enhance agro-biodiversity or on-site conservation of agro-diversity. Scientists can, in fact, reinforce farmers' dependency.

Sometimes seed fairs are used by formal breeding institutions as a means of obtaining participatory input from farmers in the selection of varieties/ lines developed (as in the case of INCA in Cuba, see Ríos and Wright, 1999). This is usually done as part of an effort to increase seed diversification using varieties developed and introduced at the breeding institutes. As a result, the primary role of the breeders is reinforced, and the farmers' role is reduced to assisting breeders in developing their selection criteria by identifying the most promising lines.

On a more positive note, seed fairs are great opportunities for scientists to study farmers' practices, knowledge and PGRs. Seed fairs can also facilitate access to certain rare varieties (see FAO, 2006). In this way, seed fairs help raise awareness among scientists about the importance of agro-biodiversity, and can open their eyes to farmers' capacity to breed varieties as shown in the CBDC-BUCAP-organised seed fairs.

The challenge [for scientists] is not to find ways to integrate, in modern management practices, knowledge, innovations and practices of indigenous and local communities. Rather, it is to define, in collaboration with indigenous and local communities, which modern tools may be of help to them, and how these tools might be used, to strengthen and develop their own strategy for conservation and sustainable use of biological diversity, fully respecting their intellectual and cultural integrity and their own vision of development (UNEP 1994:4 cited by Gonzales, 2000).

If the right approach is taken, the participation of scientists can be useful to help farmers improve their selection methods and possibly increase diversity, as shown in an example from Peru:

The participation of the university facilitated a wider exchange of knowledge about the breeding of seed diversity and generated interest in the diversity of knowledge about the culture of the seed possessed by the Quispillacta comuneros. Through the exhibition of its plant germplasm collection, particularly a number of "lost" ecotypes, the university attracted the attention of the farmer participants. (Gonzales, 2000)

Traders and seed companies (and the modern seed varieties they often bring)

A seed fair that offers direct seed handouts is not ideal. The idea of conducting seed fairs with vouchers has been promoted as an improvement on this model. Seed fairs are supposed to offer farmers greater choice of seed to replenish their stocks.

However, farmers manage to keep more seed than often thought:

Assessments of what is later [after the distribution of fresh seeds] planted reveal a multiplicity of seed sources, including stocks saved despite the worst disasters. Supplies of certain seed crops may be limited, but most farmers are generally able to save some seed from a previous harvest, and trade between households is common (Rohrbach and Mazvimavi, 2006).

This does not mean that farmers are uninterested in easy (cheap) access to modern varieties. Seed fairs with subsidized access (vouchers) represent an opportunity to access modern varieties (see Rohrbach and Mazvimavi, 2006). And after a debilitating drought or other disaster, farmers will be looking for modern varieties; these are the most likely to have been lost because they are less adapted to local farming conditions.

One further has to keep in mind that seed fairs utilizing vouchers normally occur in a context where farmers are more or less used to frequent support in the form of seed handouts and, thus, might very well speculate that the seed fair won't be the last time they will be

receiving support. Adapting their behaviour to this context, one can expect that these farmers might be more inclined to access modern varieties, their risks being mitigated and their access facilitated. In fact at some of these fairs the set up is such that farmers are to first “buy” modern varieties of maize before they can look for other seeds:

Maize seed accounted for almost 80% of the total quantity of seed sold at seed fairs from the nine districts surveyed. This high volume and amount partly reflects the links between NGOs and agrodealers (Mazvimavi et al., 2008).

and

While open pollinated varieties have been introduced as an option allowing farmers to save money on seed by not purchasing fresh seed each season, most farmers seem to recognize the yield advantages offered by hybrids. Most are willing to continue to pay for this seed each year; though if an NGO is willing to provide this seed for free (perhaps through a voucher) farmers are even happier (Mazvimavi et al., 2008).

Participation of traders and seed companies at seed fairs facilitates access to modern seed varieties. This can make it more worthwhile, economically, for farmers to acquire and cultivate broadly accepted modern varieties of various staple crops (as ICRISAT experience in Zimbabwe shows).

However, it is not easy to ensure participation of seed companies and seed traders at the fairs, as they look for guarantees to make sure their investment (in time and transport costs) is worthwhile; they don't like to return home with a couple of tons of unsold seed. Organizers, therefore, tend to accommodate traders and companies by negotiating seed quantities and prices, beforehand, with a limited number (1 or 2) of traders. This can end up limiting the diversity of seeds available:

Due to the nature of the relationship between NGOs and a few agro-dealers, most fairs were dominated by the supply of either a single variety of open-pollinated maize seed (generally ZM 521), or a single variety of hybrid maize seed. In effect, most farmers did not have a choice of what type of maize seed to purchase (Mazvimavi et al., 2008).

If markets are not functioning properly, the use of subsidized seed (by vouchers)--combined with the presence of traders/seed companies--might be a way to facilitate access to modern varieties of seed. However, according to Rohrbach and Mazvimavi (2006), while these seed fairs may increase seed choices compared to fairs with direct hand-outs, there is no evidence they contribute to improvements in agro-biodiversity:

As sometimes argued that the injection of cash through vouchers would stimulate the local economy the cited evaluation found that sales of maize seed accounted for more than 90% of the total value of seed sold at the fairs. By inference, the vast majority of seed investment left the local community and ended up in the hands of urban-based agro-dealers and seed companies (Mazvimavi, 2008).

Furthermore, the modern varieties are more likely to be lost again (as they are less adapted than landraces), so if you promote them at seed fairs you might be perpetuating a vicious cycle.

In order to facilitate access to seed, seed should be inexpensive. At seed fairs in Zimbabwe, where the voucher system was used, and traders participated, prices were at least two times higher than in local markets, even though costs were partially off-set by vouchers for poor farmers (Mazvimavi, 2008):

The development gains often attributed to seed fairs [with a voucher system] compared to seed handouts (eg, increasing community incomes, promoting local seed production and improving agro-biodiversity) appear to be overestimated. Seed fairs facilitate community seed trade. But they may be monetizing a traditional obligation to share limited seed stocks. There may be more seed on the informal community market, but its accessibility to poorer households may be diminished unless vouchers continue to be provided. The fairs appear to be inflating local seed prices and they do little to strengthen the stocking of seed in local retail shops (Mazvimavi, 2008)

By contrast, in seed fairs organized by the provincial farmers' union in Nampula, in which only farmers participated, participants appreciated that prices were low compared to the local markets (Bakker and Martínez, 2009).

So unless you are dealing with modern varieties that fill a unique niche and/or are well-adapted to the area and farmers are genuinely free to choose, it seems unnecessary (and costly) to have traders and seed companies at seed fairs. The participation of seed companies and seed traders does nothing to strengthen the position of farmers in terms of reducing reliance on external resources. Furthermore, as the experience in Nampula, Mozambique shows, farmers explicitly appreciate having a marketing forum of their own (Bakker and Martínez, 2009).

Timing

When holding a seed fair, take into account the availability of farmers. It is generally better to hold a fair in the slack (usually the dry) season, after harvest and before land preparation for the next rainy season.

Do not try to hold a seed fair very late in the dry season. Rains can start early and they can be late, but farmers need to be prepared for the earliest rain. Farmers in many different countries complain that the rainy season is becoming more unpredictable, both in timing and in amount of rain, a clear indication of changing climates. For each day's delay of planting after the rain, a farmer loses an estimated 1.5% of the potential harvest. Early rains can be as much as two months before the "normal" rainy season. Therefore, depending on the crop, in areas with very irregular rainfall, farmers tend to sow the seed before it actually rains which means, that when rain is insufficient or stops, the farmers have to plant again. If the fair is held late in the dry season, farmers might already have planted much of their seed.

At the same time, a seed fair should not be held too soon after harvest. Planning is easier when the fair only deals with one type of seed (e.g. tomatoes), like the seed fairs held in Cuba by INCA, (Ríos and Wright, 1999), but not all crops are harvested at the same time. Harvests also depend on the time of planting, which can vary considerably from one year to the next. Consider the main staple and commercial crops in Northern Mozambique: peanuts can be harvested from February to April, maize and cowpeas can be harvested from April until June, and rice and sorghum are harvested from June until August. Pigeon peas and cassava are ready even later, and are harvested in August and September. Seed must be well-dried to maintain its quality, so sufficient time should be allowed for proper drying of the harvest.

Many organizations try to schedule a seed fair so that it can be integrated into existing local cultural festivities or other events (such as World Food Day) that take place more or less around the time of the planned seed fair. This may be a way to firmly establish seed fairs within the community and to ensure better participation, but take care that the main focus of the seed fair is not lost.

In general, depending on the seasons, a seed fair is best held between two and three months before the "normal" start of the rainy season, in order to guarantee timely access and availability of good quality seeds and high levels of participation from farmers.



Fairs go beyond just exchanging seeds; a dance group at a seed fair in Nacuaho B, Nampula, Mozambique

Organization of the seed fair

"Unlike more formal agricultural fairs, which farmers attend as passive spectators of others' materials and technology, a seed diversity fair gives farmers the opportunity of meeting to discuss and demonstrate not only their own seeds, but also their local practices and knowledge that are linked to specific seed varieties, storage, processing and use." (FAO, 2006)

The value of a seed fair—its benefit to farmers as an occasion for the exchange of seeds and ideas—is not determined solely by the planner's technical knowledge (e.g. of how to enhance diversity and knowledge development). Success also depends on the organizers' recognition and appreciation of the connection between seed diversity and cultural norms influencing the exchange of seeds and knowledge.

The organizers (external organizations, farmers' organizations or communities) of a seed fair start discussing the seed fair with the communities involved preferably two months or more before the envisioned date. Discussion should include the

objectives, the distribution of responsibilities, the selection (process) of the participants (including gender) according to the objectives, timing, location, guests to invite, cultural activities and logistics.

For farmers to become active participants (as opposed to passive visitors), they must assume the lead in organizing the fair, perhaps by having the community or farmers' organization select an organizing committee. When farmers do the organizing, dynamics change.

Involving farmers in organizing the seed fair is a way to include the community's own culture and identity. In most cases, this results in the integration of cultural activities (songs, dance, theatre) conducted by local groups. The activities strengthen the connection to the local community and at the same time serve as a way of providing messages and opportunities for reflection regarding seed, diversity, organization etc.

The invitation of guests (for example local authorities) is a strategic issue. Seed fairs are a very suitable platform for bringing various stakeholders engaged in PGR conservation together. Thus the fair can serve as a meeting point for policy makers, district administrators, researchers, extension agents, seed companies, local government officials, representatives of religious institutions, students and farmers. Through the concrete activity of the fair they can better understand and appreciate the value of PGR and the role of farmers. When local government becomes interested, seed fairs can be integrated in annual activity planning, which could help to ensure continuity of the activity (see Katwal and Wangdi, undated). By inviting media (e.g. local radio), the messages of the fairs can be spread even further.

The location is important, as it should be a place where farmers feel comfortable and that facilitates exchange. Usually it is best to let the community identify the area. For example, in Mozambique the fairs are usually held under a couple of trees, with the area demarcated with grass fences, where the participants display their seed on mats. For the officials, who are invariably (and rightly) invited, tables and chairs are available. At the FAO-promoted fairs in Tanzania, a bit more effort was invested into setup of the fair ground, with *"all the displays arranged on well-constructed tables in temporary huts,"* but still making sure that *"everything was open and easy to see."* (FAO, 2006)

Rotating the seed fairs among communities involved will stimulate wider participation and exchange between communities.

In a lot of seed fairs, farmers (or farmers' groups) are customarily rewarded for diversity, quality/and or quantity of the seed presented at the fair by giving awards according to pre-established criteria. In Mozambique, symbolic presents were also offered to the local authorities as appreciation for their support and participation.

If the set up of the seed fair is well done, it can become a means for farmers' communities to show the richness of their culture and their wealth of knowledge so often ignored by officials, extensionists and scientists. This, in turn, can boost the self confidence of farmers.

Context of the seed fair

Holding a seed fair can be a practical way to initiate discussion and exchange on issues like access to seed, biodiversity and sustainable agriculture. Although seed fairs do improve access to seed and the maintenance of agrobiodiversity, by themselves they are unlikely to reverse trends in uniformization of seed and increasing farmers' dependency on external inputs (seed, chemical fertilizers and pesticides).

Seed fairs, for example, don't address directly the issue of seed quality in terms of genetic improvement and of guaranteeing that seeds are free from viruses and have good germination. Yet, seed quality issues are important considering that formal breeding institutions have developed seed quality standards that are being used (via legislation for example) to promote modern varieties (which can impede the distribution of landraces).

It is, thus, not surprising that most seed fairs are organized within the context of a wider program of development alternatives for small-scale farmers. Examples of such development programs have been PPB projects (CBDC-BUCAP project in Asia), the promotion of local production and the set up of community seed banks in Ceará, Brazil (Pinheiro and Peixoto, 2004), the promotion of sustainable and/or organic agriculture in Costa Rica (Greenheck, 2010) and the development of farmer-to-farmer approaches for agricultural innovation in Nampula, Mozambique (Bakker and Martínez, 2009).

These approaches have several things in common:

- An emphasis on farmers' skills, knowledge and involvement;
- The realization that small-scale farming systems have specific seed requirements; and
- A recognition of the key role small-scale farmers play in maintaining agro-biodiversity.

Sustainability

The sustainability of seed fairs depends to a large extent on how well the activity becomes integrated in the community, and on the attitude of local officials to seed fairs. Although seed fairs, as such, are not necessarily an existing local activity, there are many links to local culture such as informal seed exchanges, the festivities related to the agricultural calendar, and a recognition of the importance of diversity.

There are a number of "success stories." In Costa Rica, a local NGO forum took up the idea of seed fairs (Greenheck, 2010). In Mozambique the concept of seed fairs has spread from Nampula province to other provinces through the national farmers' union (UNAC).

Sustainability can be enhanced by including local authorities in seed fairs, but this depends on the relationship that farmers' organizations have with local authorities. For example, in Bhutan, the annual plans of local agricultural offices have begun to feature seed fairs as part of their activities, with religious institutions and schools also participating in the fairs (Katwal and Wangdi, undated). But in Mozambique, where agricultural extension offices receive money from seed companies (Monsanto), government officials tried to convince the farmers' organizations to include companies selling modern varieties of seed, fertilizers and herbicides at the fair.

It does not cost much to organize a seed fair within a community (without a subsidized seed distribution component), and in fact if a community picks up the idea, it can easily be self sustained. All that is needed is a space with some shade and some food. When the fairs are bigger, with farmers from different communities involved, they become more expensive as logistics get more complicated (e.g. transport is the biggest expense). But if the fair is organized by farmers and their organizations, costs will remain limited.

Conclusion

Different types of activities are covered by the term seed fair. One type of seed fairs takes place in the context of on-farm biodiversity management and strengthening of farmers position, while the other type takes place in a context of seed distribution following calamitous growing conditions (droughts, floods). While the benefits of the latter, which mainly has been compared to direct seed handouts, appear to be overestimated the first type seems to play an important role within its context.



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