

## 2.8 The community seed bank

### A common driver for community biodiversity management

*Pitambar Shrestha, Genene Gezu, Saujanendra Swain,  
Bertrand Lassaigue, Abishkar Subedi and  
Walter Simon de Boef*

#### **A backup to informal seed systems**

In the early 1990s, many development organizations began to support the establishment of community seed banks (CSBs) with the primary goal of enhancing food and seed security. The normal agricultural development paradigm assumed that all farmers, from subsistence to commercial, would eventually become clients of public and private seed systems, and the formal sectors would ensure their access to quality seed of improved varieties (Douglas, 1980; Frankel and Soulé, 1981). We now realize that this never actually happened. Small-scale farmers in Africa, Asia and Latin America, but also in Europe and North America, use farm-saved seed and rely to a large degree on the informal system for accessing new materials (Byerlee *et al.*, 2007; Louwaars and De Boef, 2012).

Limitations of farm-saved seed and the informal seed systems led to the establishment of CSBs for increasing seed and food security. When farmers lose their seed or varieties, they depend either on quality seed of improved varieties that has been commercialized through agro-dealers, or on the seed of improved varieties that is distributed by governments. However, the varieties are not necessarily adapted to local agro-ecological conditions or specific demands (Abay *et al.*, 2008). The CSBs ensure sufficient seed of the right (local) varieties is available at the right time and for an affordable price, thus enhancing seed security (De Boef *et al.*, 2010). They complement the formal seed sector, in particular for those crops and varieties that are not addressed in seed production and marketing because they are not commercially interesting, or because the market for such crops and varieties is too small (Louwaars and De Boef, 2012). CSBs serve as backup to the informal seed sector, and they motivate farming communities to rely on their own institutions and remain autonomous in their food and seed security. Their success in recovering seed and varietal sovereignty – and thereby food sovereignty – is well illustrated by Dias discussing the Seeds of Passion network in Paraíba, Brazil (Chapter 2.7).

## **A practice within community biodiversity management**

In the context of community biodiversity management (CBM), CSBs are considered a common practice for securing the availability of local varieties (Jarvis *et al.*, 2011), thereby contributing to the on-farm management of plant genetic resources (PGR). In this chapter, we will share examples of CSBs that address seed and varietal security within the framework of CBM. CSBs form the social and institutional capital required to make CBM work as a collective and conscious process in conservation (Pretty and Smith, 2004; Shrestha *et al.*, Chapter 1.3). In addition to the experiences of the Semi-Arid Network-Paraíba (ASA-PB) in Brazil (Dias, Chapter 2.7), and the Collaborative Programme on Participatory Plant Breeding (PPBMA), in Central America (Fuentes and Alonzo, Chapter 2.6), we look at and compare experiences working with CSBs in Bangladesh, Ethiopia, France, India and Nepal, and relate these to other activities in Canada, Mali and Mexico. We try to capture commonalities and variations that exist for the practice, which are summarized in Tables 2.8.1 and 2.8.2. Before sharing the case studies, we outline some common principles. We conclude by drawing some lessons from CSB practice within the larger framework of CBM.

### **Common principles**

The CSBs are collections of seed that are maintained and administered by communities in a central facility or in a structure that is shared among a range of individuals. They are usually established in collaboration with local organizations and, sometimes, national gene banks (Jarvis *et al.*, 2011). A common feature is that non-governmental organizations (NGOs) and civil society organizations (CSOs) play a key role in their establishment and management. Seed is stored in large samples, to ensure that adequate and sufficient planting material is available (to achieve seed security), and/or in small samples, to ensure that local varieties are available for regeneration when varieties are endangered (to achieve varietal security), as shown in Table 2.8.2. Some CSBs have a well-defined relationship with public or NGO gene banks to ensure that a backup system is available under a normal access regime (Bangladesh and Ethiopia), or a black-box arrangement (India). The seed is primarily retained for members or farmer beneficiaries, using informal measures of quality control. The CSBs in France and Canada operate as national networks. The Seeds of Diversity network in Canada facilitates the maintenance and exchange of seed among its members. The national network in France does have a central storage facility, but its members conduct regeneration, as in all other CSBs. Common to all CSBs is that they increase farmers' access to, and timely availability of, diverse types of quality seed and planting materials of locally adapted (not necessary only local) varieties at reasonable prices or conditions. They also ensure farmers' sovereignty over access to seed and varieties (Bangladesh, Brazil, Central America, France, Mexico and India). CSBs can also be considered a practice that contributes to the realization of farmers' rights.

Table 2.8.1 Characterization of community seed bank networks, 2011

Country	Name of facilitating organization	Type of organization	Specific area	Major crops	Year started	No. of CSBs	Average no. of members/CSB
Bangladesh	UBINIG	Private organization	Scattered areas; 19 districts	Rice, leafy vegetables, pulses, oilseeds, spices, uncultivated food plants, fruits, timber plants, medicinal plants	1994	6 + 23 <sup>d</sup>	1300
Brazil	ASA-PB	CSO <sup>a</sup>	Parabá	Maize, cowpea, lima bean, common bean	1993	205	20
Canada	Seeds of Diversity	CSO	National	Vegetables, fruit, grains, flowers and herbs	1984	1	1400
Ethiopia	IBC/EOSA	NPGRP <sup>b</sup> /NGO	Oromia, Amhara and SNNPR <sup>c</sup>	Wheat, chick pea, grass pea	1994	14	680
France	AgroBio Périgord	CSO	Local/national	Maize, several others	2001	1 + 7 <sup>e</sup>	280 <sup>f</sup>
India	MISSRF	NGO	Orissa, Tamil Nadu	Rice, millets, pulses	1999	38	40
Mali	USC	NGO	n.d.	Sorghum, millet, cow pea, bambara groundnut	1994	7	280
Mexico	Instituto Simone Weil	CSO	Mexico	Maize, vegetables, medicinal plants	2003	10	200
Nepal	LI-BIRD	NGO	Scattered across Nepal	Rice, legumes, gourds, millets, vegetables	2003	14	360

Source: based on an email survey carried out by LI-BIRD, with partners, UBINIG, ASA-PB, Seeds of Diversity, IBC/EOSA, AgroBio Périgord, MISSRF, USC, Instituto Simone Weil and LI-BIRD, in 2011.

a CSO – civil society organization; b NPGRP – National Plant Genetic Resources Programme; c SNNPR – Southern Nationalities and Peoples Region; d 6 community seed wealth centres and 23 seed huts; e AgroBio Périgord has a local CSB that serves a national CSB, to which seven other CSBs are associated; f number refers to the CSB of AgroBio Périgord and not its sister CSBs.

Table 2.8.2 Characterization of seed and varietal management aspects, and institutional ground of community seed banks

Country	Name of organization	Mechanism	'Seed bank / loan arrangement'	Varietal security strategy	Link with public gene bank	Specific observations
Bangladesh	UBINIG	Seed and varieties	200% (double seed)	Members continue to cultivate, specialized seed farmers maintain specific varieties, community seed wealth centres (CSWC) and gene bank serves as backup	Functional link with public gene bank as backup	Organized seed conservation – CSWC have linkage with national gene bank, seed hubs, specialized seed keepers; focus on promoting autonomy, and sustainable agriculture and uncultivated food
Brazil	ASA-PB	Seed and varieties	120% (flexible community-based)	Members continue to cultivate, community seed bank (CSB) and mother banks serve as backup	None	Emphasis on autonomy in seed and varieties; use of seed of local varieties for institutional market supports CSB network
Canada	Seeds of Diversity (SoD)	Seed and varieties	Exchange among members	Living gene bank, members cultivate accessions, and provide access to members	Informal link, no formal backup	Accessions remain with members; community is composed of persons with shared interest; network is national; sod facilitates access to members
Central America	PPBMA	Seed and varieties	Provision in times of disasters; otherwise sales	CSB contracts out cultivation to maintain the reserve	None	Emphasis on being a backup system in case of climatic disasters for both seed and varieties
Ethiopia	IBC/EOSA	Grain, seed and varieties	Introduction if new, otherwise back-up with dissimilar arrangements	Community-based gene bank, formal gene bank acts as backup	Informal link	CSB associated to legal entity (cooperative); continuous links with and support from NGO; organization is a base for other activities
France	AgroBio Périgord	Seed and varieties	Return of 300% seed for sharing, evaluation and storage	Sharing with as many farmers as possible 'in vivo', and maintenance of rare varieties	Informal link, no formal backup, collaboration in research	All entries are tested for GMOs; community is composed of farmers and amateur gardeners with shared interest; network is local and national; AB Périgord provides access to members only
India	MSSRF	Grain, seed and varieties	100–150% (seed)	One farmer-one variety, <i>in situ</i> community-based gene bank through (black box) backup	Black box; MSSRF-gene bank	Traditional knowledge through village
Nepal	LI-BIRD	Seed and varieties	Link with CBM fund	Diversity block, fund beneficiaries grow one variety each	Not yet but in process	'Redbook' of information and associated traditional knowledge maintained; CSB is sustained through links with CBM fund

Source: Based on an email survey carried out by LI-BIRD, with partners, UBINIG, ASA-PB, Seeds of Diversity, IBC/EOSA, AgroBio Périgord, MSSRF, and LI-BIRD, in 2011.

## Case studies of community seed banks

### *Safeguarding rural livelihoods in Bangladesh*

Since 1984, Policy Research for Development Alternative (UBINIG; Unnayan Bikalper Nitinirdharoni Gobeshona), a private research organization in Bangladesh, has been supporting a network of 300 000 farmers, called the Nayakrishi Seed Network (NSN). The NSN is an organized effort to promote local seed conservation and sustainable agriculture practices, and build self-reliance in communities. At agro-ecological zone level, UBINIG has established six community seed wealth centres (CSWCs) similar to ASA-PB in Brazil (Dias, Chapter 2.7). The main function of the CSWC is to provide backup seed storage and maintain a compatible passport data system with the national gene bank, thereby facilitating the access to and exchange of seed between *ex situ* gene banks, and linking with on-farm management. These CSWCs maintain up to 2400 accessions of different types of food crops, including uncultivated ones. CSWCs are integrated with 23 Nayakrishi seed huts that are located in various parts of the country, and which use common CSB working principles. These seed huts provide seed to on average 1300 members (Table 2.8.2); returned seed is stored for multiplication and for wider distribution through the CSWCs. Furthermore, the seed huts are linked to over 332 specialized seed keepers (111 of whom are women), located in different clusters of the communities, who make sure that quality seed is produced and that local seed stocks meet the urgent demand of farmers. The involvement of the NSN in seed banking in Bangladesh is contributing to the on-farm management of 2300 rice varieties, a unique success in an era of high genetic erosion of local crop varieties.

### *Establishing conservation cooperatives associated to CSBs in Ethiopia*

In the 1990s, the rich diversity of durum wheat varieties in the central highlands of Ethiopia was almost entirely displaced (95%) by the intensive introduction of improved bread wheat varieties. Farmers became dependent on annually purchased seed, making their agriculture economically and ecologically less beneficial. In response to the common critique that genetic resources in gene banks are not easily accessible to farmers, the Institute for Biodiversity Conservation (IBC) conducted a series of activities in the early 1990s, in which local varieties of several crops were reintroduced (Worede and Mekbib, 1993). The next step was the establishment of CSBs, to enable communities to maintain and use their varieties with autonomy.

While the IBC played a critical role in the initial establishment of CSBs, the NGO Ethio-Organic Seed Action (EOSA) has been providing continuous support to six CSBs in Amhara and Oromia since the early 2000s. EOSA provides technical support and oversight to ensure that seed regeneration through the CSBs maintains the required quality. Currently, it is supporting the establishment of two new CSBs in Oromia. Another five CSBs have been constructed in the Southern Nations, Nationalities and Peoples Region (SNNPR). Regassa Feyissa and colleagues describe the activities of EOSA in more detail in Chapter 1.4.

CSBs in Ethiopia are legal entities with a well-established governing structure and mechanisms for their management. They also act as conservation and seed producer cooperatives. After almost two decades of investment in human resources and infrastructure, and support through institutional and technical assistance, the conservation cooperatives are well organized and sustained (Gezu and Seboka, 2012). The awareness and experiences gained have resulted in the maintenance and use of a higher degree of crop diversity by participating farmers (Bezabih, 2008). These conservation-oriented CSBs in Ethiopia, similarly to those CSBs in other countries embedded within a CBM programme, benefit communities with their organizational capacity and awareness of genetic resources in livelihood development (Engels *et al.*, 2008).

EOSA has been working with the Unitarian Service Committee (USC) for many years, through their Seeds of Survival programme. The programme supported farmers in the establishment of CSBs for safeguarding access to seed of their local varieties. The USC has also been running a similar programme in Mali, and additional programmes are in the process of being set up in other West African countries. These programmes are quite similar to the CSB programme in Ethiopia (Table 2.8.1).

### ***Creating conditions for enhancing resilience and favouring farmers' rights in India***

In 1999, the M.S. Swaminathan Research Foundation (MSSRF) established a grain/seed/gene bank as an experiment in Banrangput village, in Jeypore district, Orissa. The aim was to develop a model that would contribute to achieving food security in tribal villages by ensuring the access to, and availability of, the seed of local varieties of several subsistence crops, thereby contributing to their conservation and use. Tribal communities live in areas where they are vulnerable to frequent droughts, flooding and other livelihood threats. Consequently, large numbers of tribal households face regular food shortages; many have no other choice but to consume their seed, resulting in seed insecurity and genetic erosion. Farmers are then compelled to buy seed of improved varieties, which is expensive and often the varieties do not match their farming system. A vicious circle is thus created, linking environmental stress with poverty and social vulnerability.

Over the past decade, MSSRF has been supporting the establishment of 23 CSBs in Jeypore district in Orissa. The majority of the established CSBs have become self-sustaining institutions that store varieties and seed of rice, millets, pulses and oil seed crops. The seed of adapted local varieties is available and affordable. An indirect output of the CSBs is that the aforementioned vicious circle is broken.

MSSRF also supported the establishment of a further 13 CSBs in the Kolli Hills in Tamil Nadu, fostering the conservation and use of several millet species, in particular. The CSBs have benefited more than 1330 farm households in Jeypore and 300 farm households in the Kolli Hills. In order to ensure the sustainability of the community collections, MSSRF supports the CSBs by keeping varieties in a black box arrangement in a gene bank at their headquarters in Chennai.

Besides the conservation and use of local varieties, the CSBs have contributed to the documentation of associated traditional knowledge (ATK). Information on local varieties is documented and further shared through village knowledge centres (VKCs),

which digitize the passport data of each member household. VKCs are instrumental in disseminating information on availability of quality seed among tribal villages, which further enhances seed networking and seed security beyond that of individual villages. As such, the VKCs contribute to resilience in the context of availability of seed of local varieties.

In accordance with the Farmers' Rights Act of the Government of India, the documentation maintained in the VKCs supports farmers in registering their local varieties as a farmers' varieties with the Protection of Plant Varieties and Farmers' Rights Authority (as described by Bala Ravi, Chapter 6.3). Consequently, the MSSRF model for CSBs and VKCs increases food, seed and varietal security; contributes to the conservation of local varieties; and enhances community resilience through building social institutions and strengthening the farmers' network. These results could be achieved while creating conditions favourable for the implementation of several aspects of farmers' rights.

### ***Ensuring farmers' autonomy in using local maize varieties in France***

The Maison de la Semence Paysanne ('small-scale farmers' seed house') was initiated in 2003 by AgroBio Périgord and Bio d'Aquitaine in France. Kendall and Gras (Chapter 1.7) provide more details on its structure and functioning. Farmers set up this network to create options for them to access, evaluate and exchange local maize varieties that are adapted to small-scale farming and, often, to organic production systems. With this option, they were politically motivated to maintain their independence from large-scale seed companies that advocate hybrid and genetically modified maize varieties (Gaudin *et al.*, 2009). Sovereignty over access to seed and varieties was a key motive for setting up the Maison de la Semence Paysanne.

Currently, more than 250 farmers are associated with the Maison de la Semence Paysanne, contributing to the conservation and continued cultivation of more than 100 composite maize varieties, a dozen sunflower varieties, and varieties from other species (Table 2.8.2). Each year, participating farmers return part of the seed selected from conventional plots, which is distributed to new farmers in subsequent years. To ensure that the material is not contaminated, a sample of each batch is sent to a laboratory for genetically modified organism (GMO) screening. If a seed lot is contaminated, which up until now has not yet occurred, the lot and related plots are destroyed before flowering to avoid further contamination. What is crucial is that through this scheme the network aims to use a dynamic approach to conservation, in comparison with the strict protocols used in gene banks.

Another crucial characteristic of the Maison de la Semence Paysanne is that farmers must become members to get access to varieties. As members, they contribute to conservation and experimentation, and can exchange and use the non-certified seed of most non-registered varieties. The Maison de la Semence Paysanne is thus a network, which avoids the strict seed and variety regulations of France, as described by Kastler (Chapter 6.8), and we therefore consider it to be a CSB in which the community is one made up of farmers with a shared interest. This situation is similar to that of the Seeds of Diversity network in Canada, as illustrated in Tables 2.8.1 and 2.8.2. A key difference between the networks in Canada and France is that in France an actual

physical seed bank exists, whereas the bank in Canada is virtual and accessions remain with their ‘guardians’. Seeds of Diversity facilitates conservation and exchange, which is also one of the functions of the CSB in France. The definition of community is the major difference between the seed banks in France and Canada, and their sister organizations in Africa, Asia and Latin America, while they share in common many aspects, including the motivation to enhance sovereignty in seed and varieties.

### ***Linking CSBs with the CBM fund to ensure their sustainability in Nepal***

The implementation of CSBs in Nepal began in early 1996/1997, through a USC-Canada coordinated project. Other seed banking modalities were developed in 2003, in the Bara district of the central lowlands in Nepal, as part of a global agrobiodiversity project (further described by Subedi *et al.*, Chapter 1.2). The project was inspired by the results of the CSBs in other countries, and motivated by the need to link conservation with access to quality seed of adapted varieties (Shrestha *et al.*, 2006). What was unique in Nepal was the immediate integration of the CSB into the broader CBM processes, as well as its linkage to the CBM fund, which is presented in more detail by Shrestha *et al.* (Chapter 2.9).

In general, poor and low-income farm households in rural areas do not have access to financial services. Consequently, they are not able to make the investments required to increase household income and productivity. CSB members take out loans from the CBM fund, agreeing to cultivate at least one local variety from the CSB for maintenance and multiplication. The farmers then return 50% more seed than they received. This link between the CSB and the CBM fund reduces the financial burden of members, while leveraging their farming skills for conservation services. Although it is minimal compared to other formal financial schemes, the interest generated from the loan is used to cover the costs of CBM practices, for example to set up yearly diversity blocks to compare and popularize local varieties as described by Shrestha *et al.* (Chapter 2.2), and to sustain the CSB. The experience with CSBs not only inspired LI-BIRD to set up another 13 CSBs, but also led other NGOs, and the Nepalese Ministry of Agriculture and Cooperatives, to initiate similar practices across the country. In total, more than 5000 farm households throughout Nepal are now benefiting each year from CSBs supported by LI-BIRD (Table 2.8.2).

### **The CSB as a driving force of CBM and an asset for community resilience**

The CSB practice is older than the CBM methodology itself, with its application dating back to the early 1990s (Cooper *et al.*, 1992; Sperling and Loevinsohn, 1996). CSBs have followed a series of PGR trends that are directly related to the objectives of the organizations, including:

- community-level food and seed security;
- *in situ* conservation and use of PGRFA (on-farm management);
- community custodianship;



- community access to and control over PGR;
- community autonomy and sovereignty over food, seed and local varieties;
- farmers' rights;
- resilience in the context of socio-environmental (climatic) change.

The CSBs are a common practice in CBM programmes and are used in every corner of the world. They are of vital importance for strengthening communities in their social organization, and for promoting and securing the use of local varieties. They contribute to on-farm management and move beyond the dilemma of how to implement *in situ* conservation of PGR (De Boef and Thijssen, Chapter 1.8). The CSB is in this way instrumental to the CBM components of setting-up institutional modalities, consolidating community roles in planning and implementation, and community monitoring and evaluation. We have learned from the experiences shared in this chapter that the establishment of the CSB has led to significant investment by conservation and development organizations in CBM components such as awareness-raising, the creation of social networks and institutions, and the capacity-building of community institutions (Shrestha *et al.*, Chapter 1.3). The experiences of LI-BIRD in Nepal show that CSBs are sustained by their integration with the CBM fund, while in other countries they are sustained by the motivation for seed security and sovereignty. It can be concluded that by linking conservation with access to seed and varieties, CSBs have become a driving force for the CBM process and for enhancing community resilience.

### **Note**

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