

## 23 Mexico

### Community seed banks in Oaxaca

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#### **Purpose and evolution**

In the state of Oaxaca, Mexico, ten community seed banks have been in operation since 2005. The Sistema Nacional de Recursos Fitogenéticos para la Alimentación y la Agricultura provided funding for the first five (see Chapter 42), which were built by the Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias. The other five were constructed later with support from producer organizations and the Food and Agriculture Organization (FAO) of the United Nations. The main objective of these seed banks is in-situ conservation of the plant genetic diversity present in small farm plots (or milpas) as a strategy to address climate change and improve maize, bean and squash crops and general productivity at the farm level. On average, each bank includes 40 producers, for a total of 400 farmers participating in conservation and breeding of native seed.

#### **Functions and activities**

The seed banks have several functions: conserving plant diversity; promoting seed exchange among both member and non-member farmers; participating in local, state and national seed fairs; selecting seed in farmers' fields; participating as assistants and instructors in training courses; and reproducing seed of endangered or threatened species. Because crop diversity is high in Oaxaca, the community seed banks house a broad range of species and races (Table 23.1).

Most seeds in the collections are native species; others, such as Teocintle (*Zea mays* ssp. *parviglumis*) and some beans (*P. vulgaris* and *P. coccineus*) are wild species. The amount of seed stored depends on the amount provided by producers. A portion of each type of seed is kept in a place chosen by members of the bank to store all varieties of maize, beans, squash and other crops. A larger portion is stored in farmers' homes. Each seed bank member is required to store seeds of the varieties he or she grows in amounts equivalent to those planted. However, if risk of loss is high (for example, where frost, hailstones, hurricanes or drought are likely), the amount of seed stored is two or three times the amount planted. The effects of a natural disaster can thus be immediately mitigated.

Table 23.1 Species and races conserved in community seed banks in Oaxaca, Mexico

<i>Location</i>	<i>Maize races</i>	<i>Bean species</i>	<i>Squash species</i>
San Pedro Comitancillo	Zapalote chico	<i>Vigna</i> sp.	<i>Cucurbita</i> <i>argyrosperma</i> <i>C. moschata</i>
San Miguel del Puerto	Olotillo Tepecintle Tuxpeño Zapalote chico	<i>Phaseolus vulgaris</i>	<i>C. argyrosperma</i> <i>C. moschata</i>
San Marcos Zacatepec	Conejo Olotillo Tuxpeño	<i>P. vulgaris</i>	<i>C. argyrosperma</i> <i>C. moschata</i>
Santiago Yaitepec	Comiteco Mushito	<i>P. coccineus</i> <i>P. dumosus</i> <i>P. vulgaris</i>	<i>C. ficifolia</i> <i>C. moschata</i> <i>C. pepo</i>
San Cristóbal Honduras	Conejo Olotillo Pepitilla Tepecintle Tuxpeño	<i>P. vulgaris</i> <i>Vigna</i> sp.	<i>C. ficifolia</i> <i>C. moschata</i> <i>C. pepo</i>
San Agustín Amatengo	Bolita Pepitilla	<i>P. vulgaris</i> <i>Vigna</i> sp.	<i>C. argyrosperma</i> <i>C. moschata</i> <i>C. pepo</i>
Santa María Jaltianguis	Bolita Cónico Elotes occidentales Nal-Tel de altura Olotón	<i>P. coccineus</i> <i>P. dumosus</i> <i>P. vulgaris</i>	<i>C. ficifolia</i> <i>C. pepo</i>
Santa María Peñoles	Bolita Chalqueño Cónico Elotes cónicos Olotón Serrano Tepecintle Tuxpeño	<i>P. coccineus</i> <i>P. dumosus</i> <i>P. vulgaris</i>	<i>C. ficifolia</i> <i>C. pepo</i>
San Andrés Cabecera Nueva	Chalqueño Conejo Cónico Elotes cónicos Olotillo Tuxpeño	<i>P. vulgaris</i> <i>P. coccineus</i> <i>P. dumosus</i> <i>Vigna</i> sp.	<i>C. argyrosperma</i> <i>C. moschata</i> <i>C. ficifolia</i>
Putla de Guerrero	Conejo Olotillo Tuxpeño	<i>P. vulgaris</i> <i>Vigna</i> sp.	<i>C. moschata</i>

Because most of the producers involved in the seed banks plant less than 3ha, they store 20–60kg of maize seeds, 20–40kg of bean seeds and 1–2kg of squash seeds. Only 3kg of maize seeds, 2kg of bean seeds and 500g of squash seeds are stored in the community banks. When seeds are borrowed, the recipient farmer agrees to return twice the amount of the same material to the seed bank; the seed has to be selected in the field, then cleaned and dried for storage. Stored seeds are available to all bank members and farmers in the community and in neighbouring communities; however, only the bank's managers decide whether seed is to be sold or loaned to farmers who are not members.

Training in various areas is provided periodically as part of the bank's strategy for conserving and improving native seed. Emphasis is placed on seed conservation methods (in silos, barrels or hermetic plastic containers) and on mass seed selection (Plate 13). Each producer is responsible for selecting the best plants in the field. Selection starts from the onset of flowering and ends during harvesting when the best plants are tagged. Material from some of the community banks is used in participatory plant breeding. Maize races are also being characterized by morphologic traits and industrial quality.

### **Governance and management**

Producers select a president, secretary and treasurer to manage each community seed bank. The duties of these officials include seed exchange and renewal, guaranteeing conservation of seed stocks, convening meetings and acting as liaison with the institution leading the project. A board of directors is elected for one to three years, depending on what is decided at the stakeholders' assembly.

Participation of women in seed bank activities in Oaxaca is very important. Women are involved in seed selection, conservation, exchange and use. Many are members of the boards and participate more actively than men in training courses and seed fairs, and in preparing traditional dishes.

Producers are given hermetic metal silos or barrels (with a storage capacity of 200kg) in which to store seed for planting and for stock. Farmers who participate in fairs receive diplomas and win prizes for high-quality seed, diversity or products they prepare.

Each accession stored in the seed bank has a passport containing data provided by farmers. This includes: characteristics of plant and fruit, areas to which the plant is adapted, recommended planting dates, traditional uses and agronomic advantages.

### **Technical aspects and assistance**

Each year, farmers renew the seed stored in their homes to maintain viability of seeds in the community banks. In contrast, seed stored in tropical zones is renewed every other year and seed in banks in subtropical and temperate zones is renewed only every third year. Seed selection is carried out in the central part

of each field to avoid contamination with varieties of neighbouring farmers. Once harvested, seeds are threshed and dried to 10 per cent humidity; they are then cleaned – to eliminate impurities, seed of different species and seed attacked by pests or diseases – and then stored in various sized hermetic barrels.

Financial resources are insufficient to carry out some necessary activities, such as morphologic characterization, ethnobotanical studies, artisanal seed production, regular training for producers and providing incentives to producers to encourage them to plant, select and conserve native seeds. One of the challenges faced by the community seed banks is sustainability, once government support is no longer available. To overcome this problem, as of 2013, community seed banks are being constituted as private limited rural production companies. This legal status gives farmers access to resources from the municipal, state or federal governments. Farmers have also been trained to continue conserving and selecting seeds on their own without external financial support. Several nongovernmental organizations (NGOs) participate actively in some of the banks in Oaxaca.

### **Achievements and sustainability**

The community seed banks in Oaxaca have sensitized public opinion to the importance of conserving local species. Some seed banks have won prizes for diversity and quality of varieties and products at state seed fairs. Some have increased diversity by exchanging seed within the community and with producers from other seed banks. Several wild species of beans and maize have been rescued, for example, Teocintle. Seed is available throughout the year, but seed exchange takes place mainly just before planting during the rainy season. The community seed banks store materials with valuable traits in terms of tolerance to wind, drought, pests and diseases. Some native varieties have excellent nutritional quality and are well suited to both traditional and industrial uses.

Seed banks can operate independently once they are well established, if producers are conscious of the importance of their seeds, when conservation proves to be of benefit and when the banks are formed as legal entities. They must mobilize their own resources or find external funding to carry out their activities. Cooperatives should be established to organize consolidated sales of products produced by bank members. The Mexican government should establish a public policy to support the in-situ conservation of genetic diversity in community seed banks. This strategy can mitigate climate change and reduce threats posed by transgenic materials. Genetic resources legislation is also necessary to protect farmers' biocultural resources. Community seed banks in Oaxaca should be part of a national strategy for in-situ conservation of Mexico's plant genetic resources. Creation of other banks should be encouraged in areas close to indigenous and mestizo groups who are maintaining high levels of genetic diversity or threatened or endangered species.