

13 Brazil

The Minas Gerais seed houses for conservation in times of climate crisis

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This cane here is from the time of the great grandfathers; it has been handed over from generation to generation. When someone loses her variety, there is a neighbour who has it. Look, my canes have finished, I am going to ask, then give it later back to her, the planting material comes back. So it goes, life never ends.

— Maria Cecília talking with her husband, Imir de Jesus, Community Quilombola Vargem do Inhaí, Diamantina, Minas Gerais [recorded by the authors in December 2013 while preparing a video about the roles of farmer guardians of traditional seeds and climate change]

Background and regional context

The northern area of the state of Minas Gerais is situated in the southern part of Brazil's semiarid region. It is a region of great sociocultural and agrarian diversity. The Cerrado (tropical savannah), Mata Atlântica (Atlantic forest) and Caatinga (desert) harbour a wealth of transitional plant ecosystems from highlands to savannah, enclaves of wet forest and temporary flooded areas. In this region, communal use of environmental resources is based on custom. Its peoples and traditional communities still manage and conserve a wide range of species and plant varieties for food, fibres, medicines and energy, both for home consumption and to sell. These people are the real guardians of agro-biodiversity; however, they are on the fringe of policies that recognize their territories and traditional strategies to coexist with the environment.

In 2013, a survey was conducted by a team of guardians of agro-biodiversity among 41 families in a region of the Minas Gerais outback. In cleared areas alone, 22 food species were identified, including 328 varieties; among them were 46 varieties of cassava and 49 of maize. When other units of the production system are considered (in addition to kitchen gardens), a single family interacts with hundreds of plant species, thus becoming a living germplasm bank with an enormous wealth of knowledge of the phenologic, adaptive, dietary and culinary qualities of these plants.

A few decades ago, this diversity was being maintained, but it is now in jeopardy. Large development companies, greedy for land, are expropriating

traditional territory, promoting the standardization of the food culture and distributing hybrid and transgenic seeds. More recently, climate change is causing continuous losses, and traditional agro-biodiversity conservation strategies are seriously compromised.

Emergence of seed houses

To support the struggle of local communities to defend their rights, a commission on agro-biodiversity (Comissão de Agrobiodiversidade do Norte de Minas) was created and later became a network (Rede de Agrobiodiversidade do Semiárido Mineiro). The commission was led by several popular organizations, including unions and local networks. Among the strategies they developed was the conservation of Creole seeds managed by the guardians through the creation of regional 'seed houses' (Plate 5). One of these seed houses, known as Generation House, is located in an agro-ecological experimentation and training area of the Centro de Agricultura Alternativa do Norte de Minas, a rural area of Montes Claros, in the northern region of Minas Gerais. It has been operating since June 2010, and its main objective is to guarantee the medium-term conservation of genetic material managed and maintained for generations by farmers and guardian farmers, using ex-situ, in-situ and on-farm methods.

The regional seed houses represent a conservation approach that complements other strategies and actions of a network of men and women peasant farmers, organizations and social movements in the field of agro-ecology as well as federal teaching and research institutions. This socio-technical network aims to strengthen strategies based on relations between individuals and institutional stakeholders with common goals at the regional and local levels. Together with the guardians, the network carries out such activities as agro-biodiversity surveys. The objective is to strengthen agro-biodiversity as managed by the communities, identifying the diversity, species density and varieties resistant to climate change; broadening the local diet; ensuring local and regional food security and sovereignty; and conserving traditional native seeds as well as the biodiversity of the region's agricultural systems.

Seed production and conservation

To guarantee this cultural and genetic heritage and secure access to quality seeds in quantities sufficient to meet farmers' demands, some communities, families and groups have established local seed production fields for commercial purposes. This process is usually associated with participatory crop improvement. The seed production fields are also used as complementary conservation tools and a buffer against cultivars developed under artificial conditions and genetically modified varieties.

Another strategy used to conserve and maintain traditional seeds is the community seed house (Casas de Sementes Comunitárias) and family seed stocks. These are collections of the germplasm of local cultivars, maintained

and managed by farmers. In addition to contributing to the conservation of agro-biodiversity, these collections guarantee good-quality seeds in sufficient quantities, at the appropriate time, thus ensuring farmer autonomy. They also help prevent genetic erosion and the consequent substitution of so-called 'improved' varieties for traditional seeds.

With a view to using different approaches to conservation – ex-situ, in-situ and on-farm methods – the network negotiated with the Brazilian agricultural research corporation (Empresa Brasileira de Pesquisa Agropecuária or EMBRAPA) the use of the concept of 'trustee' for the shared management of its collected accessions. The agreement includes the people and communities of northern Minas Gerais. The accessions will be conserved in the main collection at EMBRAPA's genetic resources and biotechnology centre (Recursos Genéticos e Biotecnologia). EMBRAPA will ensure the seeds' long-term conservation, minimizing contamination of the local materials by transgenic seeds.

An important forum for strengthening the network and its activities is local and regional agro-biodiversity fairs. These fairs provide an opportunity for people and communities to share their experience and knowledge, exchange seeds and other materials and discuss conservation of natural resources and public policies.

Management and functioning of Generation House

Regulations to guide operations at Generation House were agreed to by the technical staff of peasants' organizations and researchers from research and teaching institutions. The first step was the election of a management commission, composed exclusively of guardians; these three men and one woman are responsible for ensuring that the rules for collecting, monitoring and regenerating seeds are followed. The second step was to define the mandate of the regional seed house as a place for the medium-term conservation of species' diversity and accession of traditional varieties – especially those that play an important role in the communities' agro-food strategies and those that are at risk of being lost.

Samples of seeds, on average 1.5–2kg, are collected or donated by the regional seed house guardians. They are documented in a management system, in which it is also possible to register morphologic, phenologic, geographic and utilization information, in addition to any other information deemed relevant by the guardians. Subsequently, they are given codes, which help with proper identification, and then stored in a room with controlled relative humidity (20 per cent) and temperature (20°C).

Monitoring the accessions involves annual physiological tests to ensure the seeds' viability and regenerating seeds as needed. When a critical situation is noted, such as viability below 80 per cent or seed quantity less than 400g (depending on the species), a report is issued. Technical staff and trainees from federal research and teaching institutions review the reports and submit recommendations to the management committee on the need for regeneration and multiplication processes. Currently, the regional seed house stores about 70 accessions of seven species and 62 varieties.