2.7 Community seed banks in the semi-arid region of Paraíba, Brazil

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Small-scale farmers who live in the semi-arid regions of Brazil have been challenged by their environment throughout history. They use their creativity and skills to observe and learn from nature, and in this way they have developed a livelihood that is compatible with their harsh environment. Associated traditional knowledge develops over time and is actively passed down from generation to generation. Together they constitute the genetic and cultural heritage of farming communities, but are also assets that are ignored or marginalized in normal pathways for agricultural development and modernization. The recovery and use of agrobiodiversity plays an important role in vitalizing this cultural and agro-ecological identity, therefore the conservation of agrobiodiversity cannot be isolated. It needs to be associated with, and appreciate the innovative spirit and autonomy of these small-scale farming communities. The diversity of local varieties that continues to exist in these communities is a product of the capacity of these traditional societies to work with, observe and establish a harmonious relationship with Mother Nature.

In the current chapter, I will share the experiences of the Semi-arid Network-Paraíba (ASA/PB), with which I have been collaborating since 1993. I will focus on our activities in strengthening the ability of communities in the semi-arid region of Paraíba state to sustain their livelihoods, through the establishment of community seed banks (CSBs) in the recovery, maintenance and recognition of local varieties together with their traditional knowledge.

Agrobiodiversity: a vital livelihood asset under threat

The diversity of local varieties is being threatened while the normal pathway of agricultural development spreads around the world. This model is dominant and advanced in Brazil in research and extension services that also target small-scale farming communities. The commercialization and privatization of plant breeding and seed production generates large profit margins at the cost of the loss of plant genetic resources (PGR) from farmers’ hands. Exerting intellectual property rights over living organisms, as promoted by genetic engineering, can be seen as way in which monopolistic enterprises can increase their control of the seed market. Hybrid and transgenic varieties are increasingly being sold in large quantities to small-scale farmers. These varieties make farmers more and more dependent on the use of agro-toxins and chemical fertilizers, which undermines their original livelihood strategies that are compatible with their environment.
Government policies concerning seed distribution can also be considered another serious threat. We observe that these policies often contain errors in their structure and execution and, in the semi-arid regions in particular, they tend to reduce the food and seed security of farmers while aiming to achieve the opposite effect. Over the past decades, traditional seed distribution programmes have been distributing only a few varieties but in vast quantities, thus undermining rather than strengthening farmers’ livelihoods. Varieties and seed for distribution are selected based on public and private interests rather than on the specific agro-ecological system and cultural demands of beneficiary farmers. Such politically motivated seed distribution leads to dramatic genetic and cultural erosion in Brazil’s semi-arid regions; it should be noted that such policies continue and are even further encouraged up to this day.

In spite of the great challenges imposed by the capitalist model and policies that create dependency rather than autonomy, small-scale farmers and their organizations have continued to maintain their knowledge, livelihood strategies and forms of resistance over the years, by using and exchanging farmer-saved seed of local varieties. Such resistance is not only based on agro-ecological and cultural demands, but is also strongly politically motivated by the farming community’s struggle to maintain autonomy over their production system and sustain their own livelihood strategies, particularly in coping with a semi-arid environment.

Agriculture in the state of Paraíba

Paraíba is one of the smallest states in Brazil (Figure 2.7.1). Over half of its population lives in its semi-arid region. According to agricultural census data, farm properties of less than 10 ha account for 69% of the total number. However, in the region of Agreste Paraibano, in the central-eastern part of the state, small-scale farming properties form the majority (94%), although they occupy just 56% of the area. In Brazil, small-scale farmers are referred to as agricultores familiares (family farmers), since the family or household is the basic unit of agricultural production. Small-scale farmers in semi-arid Paraíba use multiple cropping systems and cultivate different varieties of cowpea (*Vigna unguiculata*), common bean (*Phaseolus vulgaris*), lima bean (*Phaseolus lunatus*), maize (*Zea mays*), cassava (*Manihot esculenta*), sweet potato (*Ipomoea batatas*) and yam (*Dioscorea* spp.). They grow several fruit and vegetable species in their home-gardens, while many of them also engage in the collection of medicinal plants and wild fruits from their surroundings. Small-scale animal production supports their integrated production system (Almeida and Cordeiro, 2002).

ASA/PB: a facilitating network

ASA/PB is a forum that brings together around 350 civil society organizations, including community associations, unions, non-governmental organizations (NGOs), parishes and social movements. These organizations are united in their goals to better coexist with the semi-arid climate, and to strengthen the autonomy and livelihoods of small-scale farmers in the region. ASA/PB was established in 1993 in response to a great social mobilization, which took place throughout the semi-arid region of north-eastern Brazil, in support of effective public policies facilitating coexistence with
the semi-arid. Since the foundation of the ASA/PB network, we have been in a continuous struggle to find new pathways to increase the autonomy of small-scale farmers and to break free from the normal pathways promoted by developmental policies and interventions that rather result in social dependency. In this struggle, seed is a core theme for ASA/PB. We have been motivating and supporting a network of CSBs for more than two decades, over which time our work and network has become a reference point in Paraíba, the north-eastern region, and Brazil as a whole.

Community seed banks

The need to reassure seed security and sovereignty

Small-scale farmers in semi-arid Paraíba use farm-saved seed of local varieties annually. However, due to the small size of their planting areas, combined with the unpredictable and unfavourable climatic conditions, many households are often unable to replenish their seed stock. Such circumstances lead many households to consume their seed. In response to this threat to food and seed security, government programmes provide these farmers with certified seed of improved varieties. Historically, these programmes have been used to serve political interests, so that seed is simply exchanged for votes during elections.

Another option for farmers is to purchase seed. However, this is most unfavourable, since the price of seed peaks at planting time, reaching up to four times higher than it would be during harvesting. Households that are unable to save or access seed end up having to access what is referred to as *semente de meia* (literally ‘seed for a half’).
Such farmers ‘borrow’ seed, agreeing to return 50% of their harvest (the ‘half’), resulting in a vicious circle of poverty associated with food and seed insecurity (Londres and Almeida, 2009).

Community seed banks (CSBs) emerged as a way of addressing issues related to food and seed security that result in poverty and lead to a disparity in food sovereignty. At ASA/PB, we developed a mechanism through which households could borrow seed from a CSB and agree to return the same amount plus a relatively low percentage at harvesting time. An informal group or association that is formed within the community is responsible for the structure and procedures for the storage, delivery and return of the seed.

**Common mechanisms for implementation**

CSBs do not have a rigid operational model. Each bank adopts its own specific procedures. Some common elements include: controlling the flow of seed (loans and returns); monitoring seed quality and storage; and surveying the demand and availability of seed in the rainy season. A seed commission was established within ASA/PB to record information from all the banks in the network in a database, which is updated annually through questionnaires and meetings (Cordeiro, 2007).

The number of members of a CSB varies and it determines the number of species and quantity of seed to be stored. For example, the CSB in the municipality of Vieirópolis has 157 members, while a CSB in Camimbas, located in the interior, includes only eight households. A large bank can store up to 7000 kg of seed, although there are cases where CSBs with large numbers of families maintain just a few varieties of seed and in low quantities (e.g. the Serrotão CSB in the major town of Campina Grande stores just 25 bags of maize and one bag of common beans for its 42 member households) (Cordeiro, 2007).

CSB members define the operational rules of the bank. The CSB of Lagoa do Gravatá, in the municipality of Lagoa Seca, for example, was established in 1998 and its operational rules were decided on during a meeting involving 35 households, which led to the establishment of an association involving members from five other communities. A committee of three persons, appointed by the CSB members, takes responsibility for the day-to-day management of the bank. The assembly fixed a return rate of 20% on the quantity of seed provided to a beneficiary household. In times of drought and loss of production from the fields, the bank can relax the rules so as not to prejudice members and to ensure the continued functioning of the bank (Cordeiro, 2007).

**Conservation of local varieties**

One of the main functions of the CSB is to provide access to the right quantity and seed of the preferred varieties, as can be seen with the São Thomé CSB in Nova Alagoa. When the CSB was established in 1974, the community maintained the seed of only two varieties, or rather types, of common bean, and depended on external sources for the seed and varieties of all other crops. In 2009, their CSB included three common bean, two cowpea, three lima bean and two local maize varieties, as well as the seed of sunflower (*Helianthus annuus*), pumpkin (*Cucurbita* spp.), sorghum (*Sorghum bicolor*) and pigeon pea (*Cajanus cajan*) varieties.
ASA/PB uses the strategy of integrating conservation aspects into the day-to-day management of the CSBs, bringing agrobiodiversity conservation into the direct domain of food and seed sovereignty. Household members of a CSB are responsible for maintaining samples of varieties included in the seed bank, thus forming an ‘*in situ* safety reserve’. In some situations, a ‘mother bank’ is established at municipal or regional level. However, the guiding principle remains that each household maintains its seed stock of local varieties, and the local CSB and ‘mother bank’ are continuously supplied with farm-saved seed. Shrestha *et al.* (Chapter 2.8) describe a similar mechanism with different levels of seed storage in Bangladesh, where seed huts form the CSBs, and Community Seed Wealth Centres adopt a role similar to that of mother banks operating at the agro-ecosystem level. Pitambar Shresta *et al.* further compare and draw common lessons from a range of experiences with CSBs from around the globe.

In Borborema, located in the Agreste Paraibano region, CSBs are organized at municipal level by the farmers’ union. The national NGO, Advice and Services for Alternative Agriculture Projects (AS-PTA), supported the establishment of a regional network of 78 CSBs. Each CSB has its own seed committee. A municipal seed committee has been established in each of the 13 municipalities of Borborema, in association with the municipal charter of the farmers’ union. In 2002, the regional ‘mother bank’ of Borborema was set up in the town of Montadas and is managed by an association of municipal seed committees. The association manages inventories, facilitates the exchange of seed between banks, organizes the receipt and redistribution of purchased seed, and distributes the seed of local varieties from existing banks to new banks (Londres and Almeida, 2009).

*Enhancement of capacities and storage facilities*

Over the years, member organizations of ASA/PB have been investing in the development of capabilities and infrastructure to improve the storage system of member households and CSBs. We organized workshops to train farmers and staff of our member organizations in the construction of silos and in the construction of drying and processing yards. Farmers constructed zinc silos with storage capacities of 30–500 kg grain, but increasingly use recycled PET 2-litre bottles for seed storage too. In 2009, the storage capacity of the network of CSBs exceeded 140 tons of seed (Londres and Almeida, 2009).

*Distribution and network*

Paraíba’s network of seed banks includes more than 240 CSBs, involving more than 800 families in 63 of its municipalities. Table 2.7.1 provides an indication of the evolution of the CSBs in Paraíba between 1998 and 2008. We have been able to rescue nearly 300 crop varieties. The network of seed banks is an illustration of a practice that contributes to community biodiversity management (CBM), where small-scale farmers, with their traditional knowledge and local varieties, assume both individual and collective responsibility for maintaining their genetic heritage. The communities and the network enhance their members’ sovereignty over seed, varieties and food; as well as their capacity to cope with their semi-arid environment. In Paraíba, our CSBs
strengthen and promote CBM, serving as a model to inspire others in the semi-arid north-eastern region of the country and Brazilian society as a whole.

Participatory research for strengthening the network

In order to strengthen its work, ASA/PB set up a partnership with researchers from the Brazilian Agricultural Research Corporation (Embrapa) and the Federal University of Paraíba. Our aim in establishing this partnership is to demystify the idea that local varieties are inferior to the improved varieties of commercial companies. We conducted participatory varietal selection (PVS) trials in which we evaluated both improved and local maize varieties using both researchers’ and farmers’ criteria. In all PVS sites, we observed that local varieties performed better than locally available commercial and government distributed varieties. We now use the research results in policy dialogues to promote the acknowledgement and appreciation of local varieties and local people’s capacities in seed production.

‘Seeds of Passion’ festivals: strengthening our identity and facilitating out-scaling

The seed of local varieties in Paraíba is called Sementes de Paixão, which means ‘Seeds of Passion’. With this name we articulate our relationship with the varieties and with the informal seed system responsible for maintaining and exchanging the varieties we inherited from our ancestors. Our enthusiasm affirms the importance we give to this genetic patrimony for guaranteeing seed security and sovereignty over our food for future generations.

Since 2004, our network has been celebrating Seeds of Passion festivals every two years. We organize the festival to reinforce the identity of the agricultura familiar and promote the use of agrobiodiversity. We joined forces with organizations from other states in the semi-arid region of Brazil, and formulated common strategies to reinforce our work and be more effective in reaching our common goals. Sementes de Paixão has become a symbol and cause in defence of sustaining the livelihoods of

<table>
<thead>
<tr>
<th>Season</th>
<th>No. of CSBs</th>
<th>No. of HHs</th>
<th>Total seed stock (tons)</th>
<th>No. of municipalities</th>
<th>No. of silos</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999–00</td>
<td>129</td>
<td>3838</td>
<td>66</td>
<td>n.d.</td>
<td>n.d.</td>
</tr>
<tr>
<td>2000–01</td>
<td>220</td>
<td>6920</td>
<td>100</td>
<td>55</td>
<td>98</td>
</tr>
<tr>
<td>2002–03</td>
<td>175</td>
<td>7441</td>
<td>78</td>
<td>51</td>
<td>n.d.</td>
</tr>
<tr>
<td>2003–04</td>
<td>205</td>
<td>7170</td>
<td>128</td>
<td>60</td>
<td>437</td>
</tr>
<tr>
<td>2004–05</td>
<td>207</td>
<td>7145</td>
<td>161</td>
<td>56</td>
<td>344</td>
</tr>
<tr>
<td>2005–06</td>
<td>228</td>
<td>6560</td>
<td>n.d.</td>
<td>61</td>
<td>476</td>
</tr>
<tr>
<td>2007–08</td>
<td>205</td>
<td>3730</td>
<td>56</td>
<td>60</td>
<td>558</td>
</tr>
</tbody>
</table>

Source: Londres and Almeida (2009).

CSB, community seed bank; HHs, households; n.d., no data available.

a Total stock of seed available before planting.
small-scale farmers. Today, our network includes more than 800 CSBs and *casas de sementes* (family-based banks with local varieties), across semi-arid Brazil. This collective of more than 15 000 small-scale farming families maintains the heritage of hundreds of local varieties and ensures their access to seed of those local varieties in a way that does not prejudice their food sovereignty.

**CSBs and policy development**

The extensive network of CSBs has gained noteworthy political weight and includes representation at many levels, from families who contribute to and benefit from a single CSB, to clusters of municipal banks, to local government representatives and the state assembly. This facilitates an exchange of experiences, resources and ideas, and provides the opportunity to influence policies (Cordeiro, 2007).

Through this structure and our influence, policies in Paraíba have started to better respond to the demands of small-scale farmers. Between 1998 and 2002, ASA/PB worked with the Paraíba state government to recover the seed stocks and create new seed banks. In 2002, a CSB programme was established under State Law 7.297, enabling Paraíba’s state government to acquire seed of local varieties for implementing its public programmes, a situation that had, until then, been the sole privilege of certified seed and improved varieties. This programme has enabled farmers to use local varieties and seed from the CSBs in contracts supplying food to the so-called ‘institutional market’ – public entities such as schools and hospitals (Schmidt and Guimarães, 2008). Between 2004 and 2010, over 180 tons of food was produced in Paraíba using the seed of 73 local varieties. This provided farmers with a revenue of up to 200 thousand Brazilian Reais (more than US$100 000).

**Development of a new pathway in agriculture**

With our experience and consolidated network, we realize that informal seed exchange is vital for sustaining the varieties and seed sources that we need. Such seed networks shape a strategy to protect communities of small-scale farmers from a number of threats they face in maintaining their agrobiodiversity. The networks are collective structures that are crucial for gaining political weight to ensure our sovereignty in the conservation of our genetic patrimony. Small-scale farmers have shown that Seeds of Passion are productive in, and suitable for, semi-arid farming conditions. The quality of seed produced by these farmers is no longer challenged. The seed produced is free from chemical inputs and agro-toxins and the fact that it does not include transgenic varieties is gradually becoming an asset for our seed producers. Those who select, store and plant the seed of local varieties are following an alternative and new development pathway, based on the strength and resources of communities of small-scale farmers. As such, we reject the normal pathway that is based on monopolies, industrialization of agriculture and disempowerment of small-scale farmers in the production system. The diversity of local varieties and the great knowledge of this genetic wealth are fundamental elements for the development and strengthening of agro-ecological production in semi-arid Brazil and beyond.