AGROBIODIVERSITY:

shared use and management in the semiarid region of Minas Gerais

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AGROBIODIVERSITY: Shared Use and Management in the Semi-Arid Region of Minas Gerais
This magazine was produced by the joint FAO/CAA-NM Project (PR-26-Brazil): “Shared use and management of (agro)biodiversity by traditional peoples and communities in the semi-arid region of Minas Gerais as a strategy for food security and to reduce climate risks”

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Editorial

» We are very pleased to be launching the magazine Agrobiodiversity: Shared Use and Management in the Semi-Arid Region of Minas Gerais. This collective effort has sought to provide a context for the semi-arid region of the State of Minas Gerais and to convey the coordinated strategies developed over recent years, to promote agrobiodiversity and coexistence with the semi-arid.

This publication was organized as part of the project entitled "Shared use and management of (agro)biodiversity by traditional peoples and communities in the semi-arid region of Minas Gerais as a strategy for food security and to reduce climate risks." Carried out during the year of 2013 by a group of peasant organizations, consulting and support organizations, research institutions and universities, the project was funded by the Benefit-Sharing Fund of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), at the United Nations' Food and Agriculture Organization (FAO).

Organizations from ten Latin American countries took part in this undertaking, through a wide-ranging exchange of information, experiences and results. Much sharing was done with public officials, particularly on issues involving agrobiodiversity, traditional peoples and communities, the semi-arid, climate change, farmers' rights and food sovereignty and security.

The objective of the project was to draw up a strategic action plan, with ample social participation, to promote the shared conservation, use

and management of agrobiodiversity in the semi-arid region of Minas Gerais, as a strategy to strengthen resilience and adaptation to climate change, and to assure farmers' rights and food sovereignty for traditional peoples and communities.

This publication delves into debates over the rights of farmers to freely use biodiversity in Brazil. We describe the semi-arid region of Minas Gerais and the strategies built collectively through decades of work. We discuss the coordinating networks for local and traditional seeds that have been used and conserved for generations; the sustainable use and potential of native plants; coexistence with the semi-arid region in times of climate change; and the role played by agroecology to enhance the resilience of agroecosystems, as part of agrofood strategies. We also share thoughts on the experience of implementing the project and on prospects for its continuity and synergies.

This magazine is an effort to synthesize those thoughts. We hope it will provoke discussions and be helpful in the search for approaches and solutions to the challenges faced day in, day out by traditional peoples and communities in the semi-arid region of Minas Gerais.

Good reading!

Fonte: NAC/UFVJM

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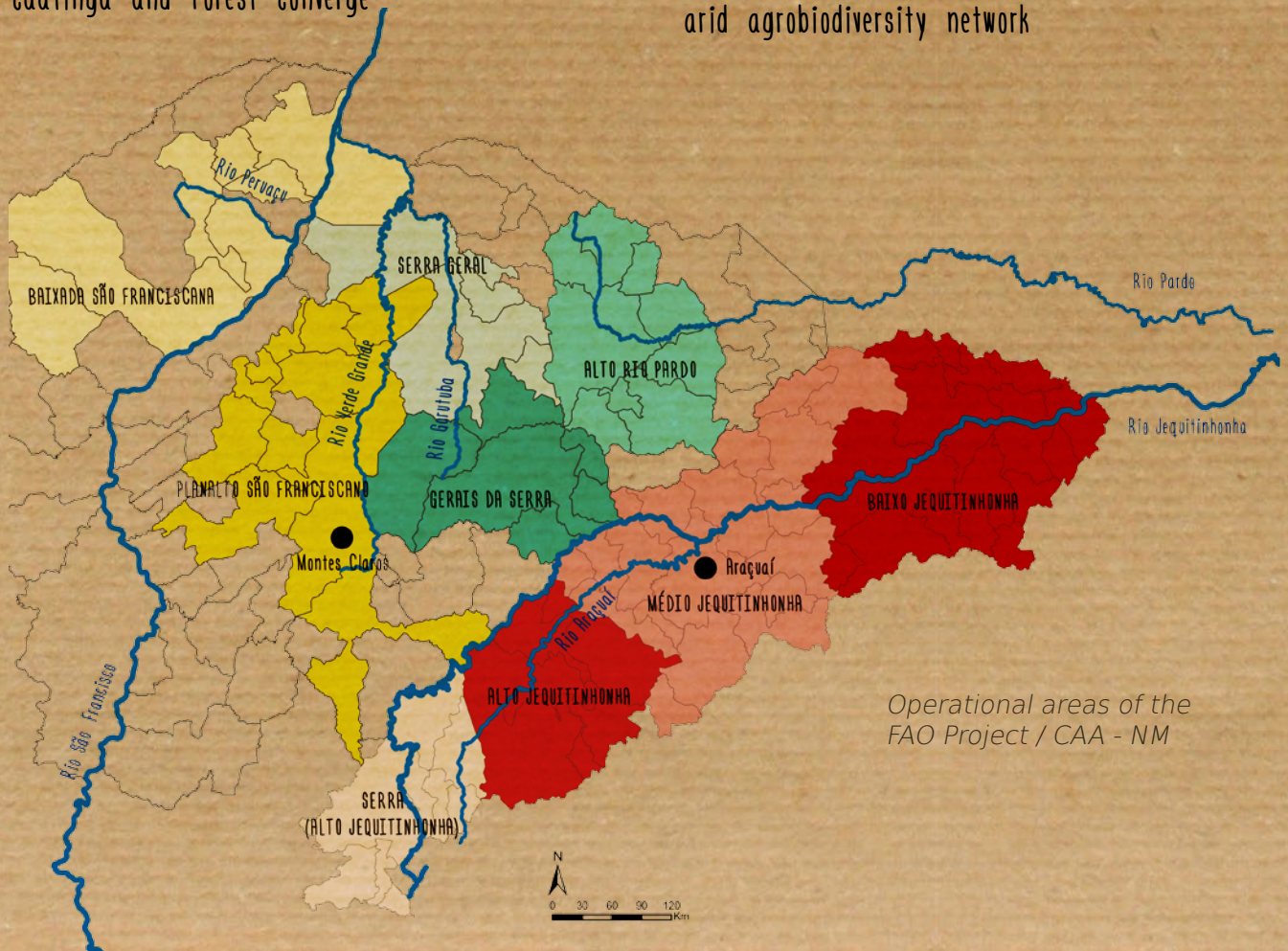

Fonte: NAC/UFVJM

Operational areas of the FAO Project / CAA - NM

Agrobiodiversity, Farmers' Rights and the ITPGRFA: Brazil's Initiative

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Photo: Léo Lima

Introduction

» The concentration of the world's population growth in developing countries makes food security for all, and for the poor in particular, a global challenge. There is broad agreement, therefore, on the need for public investment in agriculture, in order to catch up with or surpass levels achieved in decades past, with top priority for efforts to enhance the productivity and sustainability of farming and livestock activities. New and stronger public policies must also consider environmental and climate changes, for agriculture to stop being a net emissions generator, by introducing both mitigation technologies and adaptation measures.

The FAO believes that decision makers must focus on family and traditional agriculture when they draw up and implement policies, not only because this segment produces much of the food supply – and supports local and national food security and sovereignty – but also because family and traditional farmers hold the raw material and strategic knowledge needed to face those environmental challenges: the genetic resources and the associated traditional knowledge.

Following nine years of negotiations at the FAO, in 2001 countries adopted an international agreement on this theme, in force since 2004: the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), headquartered at the FAO. It was the new millennium's first major multilateral agreement, and also the first to recognize and stress the historic and present-day roles of traditional farmers in promoting agricultural innovation through the domestication of crops and their adaptation to countless climatic and environmental conditions, generating a diversification of agriculture's genetic base (germplasm) and its botanical carriers (seeds) which for several decades now have been threatened by the advance of modern farming and by rural exodus.

Article 9 of the ITPGRFA, on Farmers' Rights, delegates responsibility for enforcing those rights to national governments, within their respective specificities, but exemplifying some measures, such as: protection of traditional knowledge associated with genetic resources held by farmers, equitable sharing of benefits arising from the use of those resources and the participation by farmers in decisions affecting the conservation and use of agricultural biodiversity.

Regarding the circulation of farmers' varieties, or landrace seeds, the ITPGR-

Photo: JR Ripper

FA leaves to national governments the legal steps to assure the farmers' right to freely save, use, exchange and sell farm-saved seeds (as opposed to the "farmers' privilege" provisions of under seed-protection laws inspired by the 1978 UPOV Convention).

A criticism often heard from representatives of local peasants at multilateral for a such as the Treaty's Governing Body, is that the ITPGRFA is not correcting asymmetries between Intellectual Property Rights over industrial seeds – recognized by international agreements such as WIPO, TRIPs and UPOV – and Farmers' Rights, which are still not respected despite their presence in a binding agreement like the ITPGRFA.

In 2012, the Treaty's Secretariat, which is monitoring ITPGRFA implementation, did actually invite member countries and observer organizations to present reports on the state of realization of Farmers' Rights. Only three governments answered however (Madagascar, Norway and Poland), confirming that Article 9 is in fact being neglected by member countries, and that even in those three countries it is still in a very germinal state, restricted to public consultations.

Brazil's situation is no different than that of the majority of ITPGRFA member countries, although its UPOV-78 based breeders' protection law leaves room for relatively free circulation of landrace seeds. The legal framework for traditional seeds, however, is not clear since the Treaty was internalized by means of an enacting decree (Decree 6.476/2008) which was never regulated by enabling legislation, thus leaving it on uncertain legal grounds, subject to ambiguities due to other conflicting laws such as Provisional Measure "MP 2.168/2001", which

regulates access to genetic resources and benefit sharing under the Convention on Biological Diversity. In particular, Brazil cannot integrate the crops considered Brazilian by the ITPGRFA's Annex I into the Multilateral System – such as cassava, for example – because this would be in conflict with the provisions of that Provisional Measure.

The biggest obstacle, however, in this author's opinion, lies in the differing interpretations by different federal authorities regarding the legal status of landrace seeds. For the Ministry of Agriculture, Livestock and Food Supply (MAPA), farmers' germplasm is in the public domain since it cannot, and never could, be protected by the legal system for the protection of new plant varieties. The MAPA therefore defends free access to such seeds, with no benefit sharing under today's legislation. For the Ministry of the Environment (MMA) and the Genetic Assets Management Council (CGEN), however, genetic resources belonging to traditional farmers should be handled under the CDB's access and benefit-sharing provisions, as expressed in that 2001 Provisional Measure.

In such a context, it is easy to understand peasants' reluctance to place their traditional seeds under the stewardship of a public system, in the absence of any legal framework or clear regulations to assure equitable benefit sharing. The widespread perception of family farmers, shared by peers around the world, is that they are being fenced in by private-sector pressures to impose the adoption of registered hybrid and/or transgenic seeds and by public policies that prioritize support for research and development by corporate agriculture.

It is the FAO's perception that this situation is gradually shifting to favor family farming, due for example to Brazil's new agroecology program, but that there has been no clear decision to strengthen research in fields aimed at conservation, promotion or innovation in agrobiodiversity, in order to enhance food safety. To do that, the federal government would have to achieve an internal consensus to harmonize its own legal and regulatory framework.

We congratulate the Minas Gerais Semi-Arid Network for Agrobiodiversity, for having drawn up the plan to recover and promote the region's agricultural biodiversity, and for its efforts to implement it. The participatory approach to its creation, as well as the inclusion of all the region's players from traditional agriculture, public authorities and both local and national civil-society organizations, make it a model for Decentralized Action Plans, which the FAO hopes to disseminate and promote worldwide.

Use and Management of agrobiodiversity in the semi-arid of Minas Gerais

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Photo: Arquivo CAA

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"Two archeological ears of maize, found during excavations at Lapa do Boquete and aged at 1010 ± 40 years, . were in the same silo, indicating that populations during that period managed different varieties at the same time". (FREITAS, 2002)

›› In March 2005, on a few farms at the Americana Settlement in Jequitinhonha Valley, family farmer João Altino de Oliveira Neto identified 53 different species of plants cultivated by seven families. They included 139 different locally grown varieties. The crops with the largest number of varieties were cassava (18), beans (15) and maize (11).

Going back nearly 200 years, during the 1817-20 passage by the Austrian naturalists Spix and Martius through the Jequitinhonha Valley towards the São Francisco River, they visited the Contendas community, located in what is now the municipality of Brasilia de Minas, where they observed intensive farming activities by local residents and wrote:

> *The land richly rewards the labor of tilling, particularly maize, which has admirable yields. It is preferably sown in fine, black, clayish earth, called massapé here, like it is in Bahia. The maize is sown in October and harvested in April. In some regions, only a small catete variety is grown, which yields two crops a year. The common varieties, differentiated by the color of the grain, are: red maize, either dark-red or purple; lighter red; big yellow and round yellow. Cassava prospers throughout the backlands ... . Amongst the diverse varieties of this plant, the main ones grown are the sutinga de galho cassava, the sutinga de agulhada, the saracura, white and tiriciri, all of which grow better in the bush than in open fields." (SPIX e MARTIUS, 1981, v 2, p.86).*

Going back even further in time, we quote the 2002 study by Cenargen/ Embrapa researcher Fábio Freitas, who researched archaeological samples of maize and beans found in caves in the Peruaçu Valley, in Januária, a municipality on the banks of the São Francisco River, in northern Minas Gerais. His objective was to study the evolution of those two species in lowlands around Brazil, and his conclusions reveal a strong Central American influence on the food culture of pre-historic indigenous populations living along the São Francisco plains. The two ears of maize found there were from the region of Mexico, where over a thousand years ago the populations managed

varieties of maize, an open-pollinating species which requires knowledge about its reproductive management.

This brief introduction, covering various settings and different times, reveals the persistence, in the semi-arid region of Minas Gerais, of peasant populations able not only to maintain a great diversity of cultivated and native species, but also to manage a huge gamut of local varieties. The question is, why have these populations not given in to the yields drive of the Green Revolution and its arsenal of financial, technical and media incentives to spread homogeneous fields of commercial seed varieties, and why do they stubbornly maintain their diversified cropping systems based on a broad range of local varieties? Eduardo Ribeiro has researched the backlands of Minas for many years, and has a hypothesis: it is the social relations, the customs and even the limits of the peasant land-tenure scheme that have helped maintain traditional production systems (RIBEIRO, 2013), rooted in diversity.

This is one of the issues faced by the project entitled "The use and shared management of agrobiodiversity by traditional peoples and communities in the semi-arid region of Minas Gerais as a strategy for food security and to reduce climate risks." It is also the motivation for the work of a variety of social organizations, researchers and local leaders who have come together in this segment of the Brazilian semi-arid region. As members of the Semi-Arid Coordination (ASA) and working jointly through the Agrobiodiversity Network of the semi-arid region of Minas Gerais, these organizations focus their efforts on strengthening and expanding initiatives involving the sustainable use and management of the resources of agrobiodiversity by the region's peasantry.

There is great social and cultural diversity in the semi-arid region of Minas Gerais, along with an assortment of different land-tenure situations. The landscapes display both hilly and smooth reliefs, with unique climactic factors and plant-cover formations, making up a cultural and environmental mosaic that work out into very distinctive life styles. Even today, the region maintains common usage of environments

Photo: JR Ripper

and resources based on customary norms that regulate both the gathering of flowers and the release of cattle in the high sierra fields of the Espinhaço Range; as well as the use of fisheries in the lakes and the tributaries along the San Francisco River plains, through the Pardo River lowlands and along the Jequitinhonha River all the way to the Bahia State border.

Those norms also regulate the gathering of native fruit and the release of animals on the mesas and plateaus in the Cerrado[3], in the carrasco and Caatinga vegetation, the cantandubas and forests of the Caatinga[4] , the "seas of hills" and gorges, commonly found in the Atlantic Forest region. Common-law codes ruling access to running water and springs, be they scarce or abundant, and the exchange of seeds among relatives and neighbors or at open-air farmers' markets are all still common throughout the region.

The majority of the municipalities of Northern Minas Gerais and the Jequitinhonha Valley are located in the semi-arid region of the state. They share a long history of human occupation, as is clear at hundreds of archaeological sites all along the Espinhaço Range, which is the divide between the Jequitinhonha, Pardo and São Francisco river basins, and in

(3) Brazil's Cerrados is a wooded grasslands, encompassing a variety of tropical savannah biomes
(4) Brazil's Caatinga is a dry forest or brush biome, sometimes referred to as a savannah-steppe.

the karst geological features throughout the entire region.

This diverse and unique landscape was the scenery for colonial settlements promoted both from Bahia and from São Paulo, to raise cattle and prospect for precious minerals, which moved into a territory with a significant presence of indigenous nations that had lived there since before – or due to – the displacements imposed by European colonization. They also found a significant black population of Maroon (runaway slave) communities known here as quilombolas, mainly along the São Francisco River lowlands, where the prevalence of malaria was an impediment to the presence of white settlers (COSTA, 2005). In addition to agriculture, the local populations raised livestock, fished and used hunting and gathering in their agro-food strategies.

The practice of peasant agriculture in this ecologically diverse backlands landscape, over time ended up amalgamating cultures and agro-ecosystems, becoming home to multiple geo-histories, with a variety of socio-economic organization systems and cultural traditions (DANGELIS, 2005).

The semi-arid region of Minas Gerais is characterized by its wealth of socio-biodiversity, where traditional peoples and communities, such as quilombolas (descendants of runaway African slaves), indigenous, ribeirinhos (riverside), vazanteiros (lowlands), veredeiros (vereda swamp) and geraizeiros (Cerrado dwellers), as well as dry-flower gatherers and caatingueiros, all still manage and conserve a significant diversity of plant species and varieties which are used for food, medicine, energy, fibers and other uses, both by families and on a community-wide scale, as well as for outside markets. Those peoples are true guardians of agrobiodiversity, although they are mostly ignored by public policies that should recognize their territories and traditional strategies for coexisting with their own ecosystems.

AGRO-EXTRACTIVISM AND STRATEGIES FOR AGROBIODIVERSITY USE AND MANAGEMENT

Moving out of their invisibility, as a strategic step to guarantee their social

Photo: JR Ripper

reproduction strategies, the black populations, riverside communities alongside the São Francisco, Pardo and Jequitinhonha Rivers, and populations throughout the vast mesas, prairies and ranges covered by Cerrado and open field vegetation, began demanding rights to their ancestral territories and to their commonly-held land, both of which are primordial needs in order to preserve the immaterial heritage of which they are bearers (Costa, 2005).

Since then, new strategies have been forged for the material and social reproduction of families living in the semi-arid lands of Minas Gerais. One was to network with movements and organizations supportive of rural sectors excluded from the regions' social processes. To that end, in the 1990s the Regional Forum for Sustainable Development in Northern Minas and the Forum for Coexistence with the Jequitinhonha Valley semi-arid region were both created for family farmers' trade-union and community organizations, church ministries, No Governmental Organizations (NGOs), teachers, researchers and students to promote discussions and activities around regional development

issues and to support new outlooks for society, different from subordination to impositions by capital and to the logic of the Green Revolution.

As an outgrowth of activities by the Seed Exchange Network (RIS), which in the 1990s worked nationwide to promote landrace seeds and fight against patents on life, activities in Northern Minas Gerais and in the Jequitinhonha Valley promoted strategies to work with local genetic resources. Since then, the legal framework for agrobiodiversity and our understanding of peasant agriculture have both evolved.

That was when it became clear that, in order to maintain and expand the agrobiodiversity managed by traditional farmers as a strategy to bolster food security and sovereignty and to broaden the resistance of crops to environmental stress, it would be fundamental

Photo: JR Ripper

to defend the traditional communities' ways of life and their food culture, and to strengthen their social and technical support networks around the economic circuits of peasant agriculture. It would also be fundamental for the communities to gain access to outside information and to new technologies being developed and adapted to the region.

Knowledge of the communities' agro-food strategies is another key aspect to be developed in order to provide a context for work on agrobiodiversity management, which depends on how they use and manage their own environments, on how agrobiodiversity interacts in this process and on how it relates to their food culture and associated market circuits, which may have either a negative and positive influence, towards a greater or lesser diversity of species and varieties.

In addition to agro-food strategies, there is the problem of the traditional communities' degree of territorial control. Since the land is relatively well preserved due to the role of customary plant-based extractivism in their traditional production strategies, corporate groups and environmental institutions are taking greater interest in the region, either to establish large-scale investment projects or to create exclusive, total-protection conservation zones. When such initiatives appear, the social and technical support network comes in to advise the communities, to interact with other organizations and public authorities and to help defend the territorial rights of the traditional peoples.

Another mainstay for the work has been to enhance traditional practices that promote the local preservation of agrobiodiversity. There are always a few families in any community who work harder to maintain their seeds and manage different species of native and commercial plants, as well as families who specialize in maintaining a specific variety. In such situations, the social and technical support network works to set up family or community seed banks with better conditions for seed storage and distribution and to share skills such as better techniques for seed selection. This always involves emphasizing the value of exchanging seeds, while assuring the families' and communities' autonomy throughout the process.

The work also involves organizing a

regional seed bank, set up on the Agroecology Research and Training Station (AEFA) at the Guará Institute in the municipality of Montes Claros, to strategically centralize information into an inventory of local varieties, identifying those at greatest risk of being lost and, also those most suitable for adapting to variations in agro-environmental conditions. Longer-term seed storage (for up to six years) and the recording of this data are the basis for strategies to protect, breed and distribute varieties to other communities or to seed production fields.

In other communities and municipalities, those on-farm preservation activities are complemented by commercial-scale landrace seed production strategies, where families specialize in maintaining fields with local seed varieties and often become part of participatory breeding processes. The seed field thus becomes another space for selection and breeding, with a process of qualitative evaluation of the seeds done by the support network, with researchers and students from the Federal University of Minas Gerais (UFMG) and Embrapa (Brazilian

Photo: JR Ripper

Agricultural Research Corporation).

Some municipalities, at the initiative of farmworkers' unions or associations, are producing landrace seeds on a significant scale, particularly maize, sorghum and beans, for sale either on local markets or through the Conab (the federal government's National Food Supply Company, CONAB). Another meaningful activity has been the strengthening of retail marketing circuits for local produce and of seed exchanges, which have become common at farmers' markets throughout Northern Minas and in the Jequitinhonha Valley.

Several activities are underway to support the processing and sale of products from locally-managed agrobiodiversity, in order to open up new fronts in local and regional markets. Agro-extractivist cooperatives and grassroots community associations that have been supported in the region are now marketing products from native plants, field crops and home gardens in formal and institutional markets. Participatory studies and surveys involving merchants and family farmers have proposed several policy initiatives to local authorities, to enhance the marketing conditions for merchants at open-air markets.

In addition to supporting open-air markets, the social and technical support network has also sponsored municipal and regional agrobiodiversity fairs. The fairs help sensitize communities, society at large and public authorities to the importance of agrobiodiversity. They are also important opportunities to trade seeds, share skills and exchange experiences.

One other fundamental strategy has been to develop public policies related to seed legislation, control over access to genetic resources and to traditional knowledge and farmers' rights. This maze of laws forced on countries by the World Trade Organization, according to Juliana Santilli, has quickly fenced in and blocked the knowledge of local farmers and traditional communities to the point that "seeds have become the private property of a few, to the exclusion of all others." (SANTILLI, 2009)

In this context of diverse but inter-linked activities, the semi-arid region of Minas Gerais is re-emerging as part of the country. The region has enjoyed the local people's resistance to processes that deterritorialize agriculture and their struggle to make the best of the backlands'

cultural and ecosystem potentials, and in which both native and cultivated agrobiodiversity plays a fundamental role in their strategies for social reproduction.

Meanwhile, the interests they face today are much greater than the old latifundia. The forces led by major economic conglomerates, agribusiness and financial capital, mining and steel industries all move on a global scale, subduing national, State and local governments.

Yet the confrontation is also on a local scale, with locals developing and spreading production initiatives and practices to coexist with their regional ecosystems and with increasingly difficult climate change processes. Doing their work, stopping the machinery that destroys the Cerrado, Caatinga and dry forest areas, confronting the land grabbers and politicians who run the power structures – the confrontation takes place on many fronts. It demands a diversity of strategies and, above all, the capacity to dialog with people in any number of orbits and spaces, whether local, national or international, who are seeking synergies and converging towards worldwide sustainability.

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Seeds:
Networking strategies

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Sharing the management of agrobiodiversity

›› In order to maintain and expand the agrobiodiversity managed by family farmers as a strategy to strengthen food security and sovereignty and to increase the resistance of their crops to climate change, not only must the ways of life and the food culture of traditional populations be defended but they must gain access to information and to participation in decision-making processes. The strategy adopted by the Agrobiodiversity Network of the Semi-Arid Region of Minas Gerais has been to strengthen socio-technical support networks to expand agroecology around the circuits of family farming.

Sabourin (2000) defined a socio-technical network as a structure designed by multiple interpersonal relationships, which bring together individual and institutional players, regionally or locally, around common objects and objectives. For the Agrobiodiversity Network of the Semi-Arid Region of Minas Gerais, the socio-technical network is animated by activities carried out together by research institutions, universities, communities and men and women farmers, who organize around local, territorial and regional core groups and networks.

The work done by the Network on the use, management and conservation of agrobiodiversity is carried out based on the characteristics and experience of each territorial, regional or community group/network. The farmer-guardians carry out agrobiodiversity surveys in order to forge strategies that can help increase the biodiversity managed by their communities. The identification of the diversity and density of species and varieties resistant to climate change helps expand the local and regional food supply, assuring food security and sovereignty, the conservation of traditional native seeds and the presence of biodiversity in the region's agroecosystems.

The most recent 2013 survey, in two semi-arid regions, identified a great diversity of cultivated and native species and varieties. Both animal and plant species were surveyed, with plants grouped into: vegetable crops, fruits, medicinal, lumber and field crops (family plots). The survey identified dozens of cultivated and native species managed by a single family. To give some idea, just on the fields planted by the 45 families interviewed in the Jequitinhonha Valley, the survey identified 15 species of plants, including 221 varieties, of which there were 59 varieties of cassava and 55 varieties of beans.

Photo: Arquivo CAA

In Northern Minas, the survey with 41 families identified 22 species of plants including 328 varieties, of which there were 46 varieties of cassava and 49 of maize. Considering the other areas in the farming system (home gardens, herb plots and native species for a variety of uses), a single family may be interacting with hundreds of plant species. Their farms are veritable living germplasm banks, enriched by a huge store of knowledge regarding the phenological, adaptive, nutritional and culinary features of their resources. They constitute a cultural heritage to be maintained, supported and cherished.

What do the communities actually do, though, to appreciate, gather and expand local agrobiodiversity? Their work often begins with participatory research to evaluate landrace seeds. Such research has played a major role in sensitizing, bringing together and mobilizing communities to conserve traditional species and varieties. Moreover, they help to assess, characterize and disseminate the potential of the varieties and may even contribute to the process of seed production with information about yields and adaptation to environmental stress conditions.

Certain communities, families or groups have specialized in setting out commercial-scale local seed production fields, often in tandem with participatory plant-breeding initiatives. These seeds compete with artificially-bred and often genetically modified variet-

ies, to assure farmers' autonomous access to quality seeds in sufficient volume to meet their local demand.

Another aspect of the Network's activities is to strengthen and promote traditional practices for the conservation of local biodiversity. The identification, appreciation and strengthening of initiatives like the Community Seed Banks are part of a strategy to reduce the advance of genetic erosion and the replacement of traditional seeds with so-called "improved" seeds. Community Seed Banks are family seed reserves, collections of local crop germplasm, maintained and administered by farmers. In addition to helping conserve agrobiodiversity, they guarantee sufficient supplies of quality seeds at planting time, to assure the farmers' autonomy.

The design and maintenance of a Regional Seed Bank complements the Community Seed Banks and family seed stocks, in order to assure the medium-term conservation of back-up copies of the genetic material managed and conserved by farmers throughout the semi-arid region of Minas Gerais. The Regional Seed Bank is managed and operated together with the farmer-guardians, in order to unite and assure the complementarity of the various forms of conservation (ex situ, in situ and on-farm)

One important forum for coordinating agrobiodiversity conservation strategies is the periodic Regional Agrobiodiversity Encounter. Aimed above all at strengthening the Network's action and coordination roles, these Encounters are a chance to share experiences and knowledge amongst peoples and communities, to exchange seeds and other materials and to discuss the conservation of natural resources and public policies. They play a fundamental role in irradiating and maintaining managed agrobiodiversity.

DIALOG AND NETWORKING

The Agrobiodiversity Network of the Semi-Arid Region of Minas Gerais has entered into dialog with official institutions in the National Agricultural Research System (SNPA) responsible for the conservation of agrobiodiversity in Brazil as a whole. One of those, which is also part of the Network, is the Brazilian Agricultural Research Corporation (Embrapa), which is responsible for the long-term conservation of genetic resources for agriculture and food.

The Network's efforts to make different conservation strategies complement each other culminated in the negotiation of a Technical Cooperation Contract between Embrapa, local institutions and local farmers. The contract's general objective is to implement articles 5,

Photo: Arquivo CAA

6 and 9 of the FAO's International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), regarding the use and conservation of agrobiodiversity and farmers' rights.

In August 2004, the Base Collection at Embrapa's Genetic Resources and Biotechnology Center (Cenargen) was accredited by the Genetic Assets Management Council (CGEN) as a bona-fide depositary, meaning that Cenargen now works to conserve the vouchers (subsamples), to guarantee their correct taxonomical identification at an institution recognized by the Brazilian government and to allow for the tracking of Genetic Assets accessed by duly authorized institutions, for purposes of benefit sharing.

The Network has negotiated with Embrapa to broaden its bona-fide depository status to include the shared management of collected accesses, jointly with traditional peoples and communities in the semi-arid region of Minas Gerais, for as long as they are conserved in the Cenargen's base collection. The intention is that Embrapa continue to do the long-term seed conservation, in order to minimize the contamination of local in situ material by the presence of transgenic crops. This activity, however, must take place with total transparency, including the possibility of exchanging knowledge between farmers and researchers.

The Network's member organizations fulfill their agrobiodiversity conservation strategies with an eye to local, regional and national contexts. Their practical and theoretical activities thus give rise to new political discussions and postures, always seeking to promote the dignity of traditional peoples and communities in the semi-arid region.

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Photo: Arquivo CAA

Agro-extractivism where the cerrado, caatinga and forest converge

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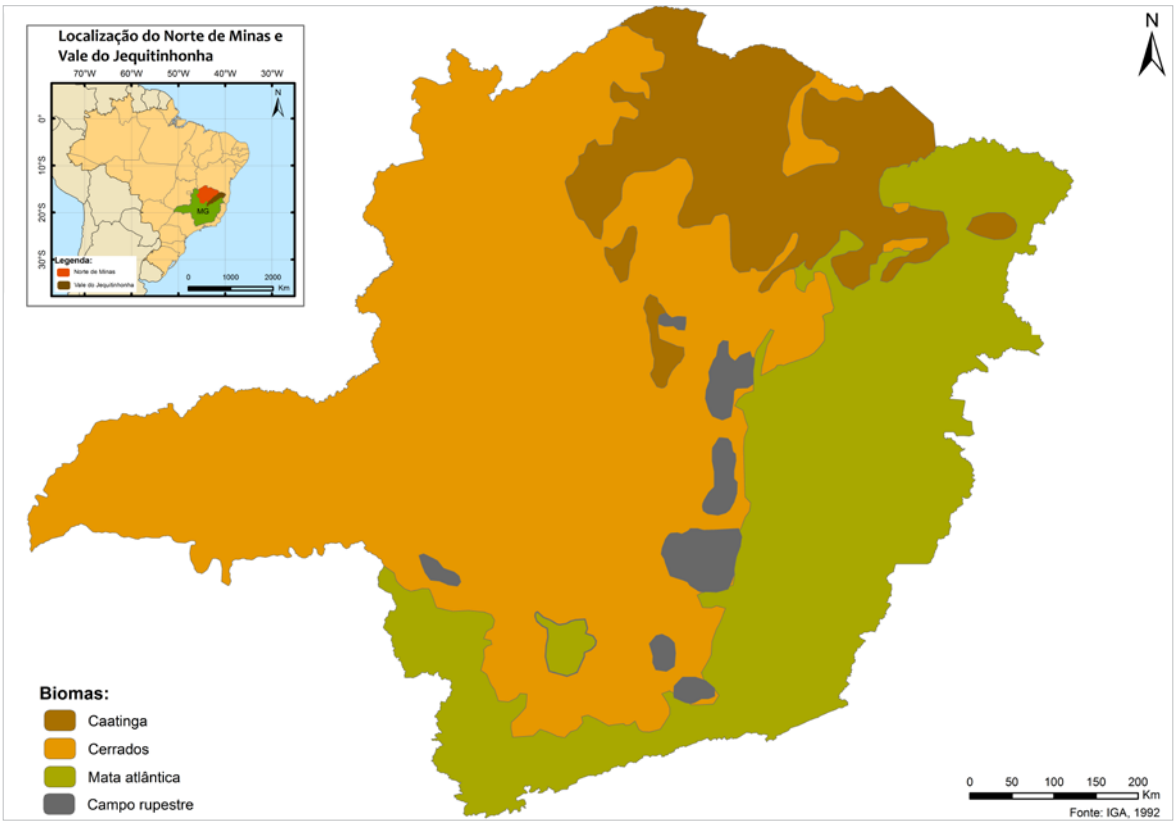
›› The semi-arid region of Minas Gerais is an exceptional region for studying agrobiodiversity and agro-extractive management, since it contains native species from the region of confluence of three different biomes: the Cerrado (Cerrado), the Caatinga (dryland brush) and the Mata Atlântica (Atlantic Forest). This convergence gives it a great diversity of ecosystems and landscapes, with different ecotones and an ample abundance of biodiversity.

One key aspect is the historic linkage between humans and nature in this region, that is, diversity not only in nature but also cultural and social diversity. Indigenous peoples and traditional communities (quilombolas, extractivists, fisherfolk, flower gatherers, family farmers, and others) all possess considerable knowledge and skills regarding these landscapes and the myriad habitats associated with traditional biodiversity management systems developed throughout history by those communities.



In order to maintain and keep that knowledge growing, to protect and conserve their agrobiodiversity and to enhance agro-extractive relationships, one crucial strategy is that these peoples and communities have resisted to defend their territories against the threat of growing encroachment by agribusiness and industrial complexes. Their struggle is difficult because both government and private policies imposed on the region focus on meeting global demands to produce commodities from so-called "dirty supply chains," such as the steel, pulp or energy sectors. In a place where the region's peasants are invisible and governments coopted by agribusiness, there have been constant setbacks to land reform efforts and to the territorial rights of traditional communities, while environmental policies are reduced to merely preservationist initiatives.

Meanwhile, although traditional peoples and communities have long made use of native fruits and plant products in the Cerrado and Caatinga, both for their own family's consumption and for commercial sale, only in recent years has recognition grown of the importance of those communities whose social reproduction strategies depend on agriculture and agro-extractivism. Such community initiatives to use and manage their environments have been further developed and expanded, along with others to process and market fruit and other products of the native flora through the use and production of:

- whole native fruit pulp: souari (*Caryocar brasiliense*), mangaba (*Hancornia speciosa*), cagaita (*Eugenia dysenterica*), strawberry guava (*Psidium firmum*), araticum (*Annona crassiflora*), jelly palm (*Butia capitata*), monkey nut (*Anacardium humile*), Brazil plum (*Spondias tuberosa*), jatobá (*Hymenaea stignocarpa*), native passion fruit (*Passiflora cincinnata*), nance (*Byrsonima coccolobifolia*), macaw palm (*Accrocomia aculeata*), cashew (*Anacardium occidentale*), tamarind (*Tamarindus indica*);
- oils: moriche palm (*Mauritia flexuosa*), macaw palm (*Accrocomia aculeata*);
- nuts: baru (*Dipteryx alata*);
- medicinal plants: arnica (*Lycnophora sp.*), pacari (Lafoensia pacari), salva-vida (*Brosimum gaudichaudii*), rufão (T*ontelea micrantha*), quina-de-papagaio (*Hirtella ciliata Mart.*), Carapiá (*Dorstenia multiformis*), pau-terra (*Qualea grandiflora*), amarelinha (*Plathymenia reticulata*), cervejinha (*Arrabidaea brachypoda*), Panama tree (*Acosmium dasycarpum*), barbatimão (*Stryphno-*

Photo: Arquivo CAA

Photo: Arquivo CAA

dendron adstringens), dom-Bernardo (*Palicourea rigida*), pau-fede (*Sclerolobium aureum*), satin-tail (*Imperata exaltata*), tibornia (*Himatanthus obovatus*), violeiro (*Schefflera macrocarpa*);

- lumber: rose pepper (*Myracrodruon urundeuva*), imbiruçu-paulista (*Eriotheca pubescens*), jacaranda (*Machaerium opacum*), locust (*Hymenaea stignocarpa*) , spiny spiderflower (*Cleome spinosa Jacq.*), pau-fede (*Sclerolobium aureum*), satin tail (*Qualea grandiflora*), souari (*Caryocar brasiliense*), paricarana (*Bowdichia virgilioides*), Panama tree (*Acosmium dasycarpum*), vinhatico (*Plathymenia sp.*);
- and several other products from cultivated fruit: pineapples (*Ananas comosus*), mangos (*Mangifera indica*), guava (*Psidium guajava*), acerola (*Malpighia emarginata*), jabuticaba (*Myrciaria cauliflora*), passion fruit (*Passiflora edulis*), yellow mombin (*Spondias mombin*), cashews (*Anacardium occidentale*), red mombin (*Spondias purpurea L.*), tamarind (*Tamarindus indica*).

This is possible due to the families' interest and need to work and increase their income, based on the appreciation of native plants, their fruit, their flowers and various other derivatives.

It is also because they need and want to preserve and conserve the Cerrado, the swampy vereda springs, the open fields and both the dry and humid forests in order to conserve water, since the region's water system is sensitive to major changes in ecosystems and landscapes, which have serious impacts on rivers and creeks. The silting and drying up of local waterways in the region has caused water supply shortages for thousands of rural families living in Brazil's semi-arid regions. They are also promoting in situ conservation of the broad diversity of native Brazilian flora species, which also contribute to the region's food and nutritional security.

Promoting the use and marketing of native fruit and products from the local flora, in addition to traditional goods like products from sugar and manioc, beans, rice and other crops, is a complementary strategy adopted by traditional peoples and communities in the region. As they combine their use and conservation of natural resources and interlink concepts like cooperativism, solidarity, food and nutritional sovereignty and security and short-distance production and consumption circuits, the local population is also intensifying its dialog with society at large.

A third strategy observed in building knowledge on agrobiodiversity and agro-extractivism in the region has been the involvement of farmers' organizations in gathering support and setting up partnerships to consolidate, expand or create new initiatives for using and managing natural resources from the Cerrado, Caatinga and Atlantic Forest. Their organizations have enhanced their production through improved agro-extractive management, processing techniques and marketing access thanks to funding and technical monitoring appropriate to each situation, as part of the communities' struggles to defend and protect their territories.

Those struggles have now spread throughout the semi-arid region of Minas Gerais. Agribusiness complexes with interest in new "greenfield" areas for their monocrop, mining, irrigation and livestock initiatives are taking a voracious look at the territories of traditional, quilombola and indigenous territories. One of their other options for expansion is to support the creation of total environmental protection areas under schemes to compensate for damage they cause elsewhere. Several traditional and landless family-farmer communities have been working in this

context to create agrarian reform settlements, agro-extractive settlements, Extractive Reserves and Sustainable Development Reserves, and against the geographical expansion or reclassification of national or State parks encroaching on their territories.

There are several initiatives underway to coordinate with civil society, for example the Grande Sertão Cooperative, which for ten years has made significant contributions to organizing farmers and traditional peoples and communities to produce and market the products of their sociobiodiversity.

The Cerrado Network (Rede Cerrado[4]) of NGOs is another major initiative, as a grouping of social organizations and movements in the Cerrado aimed at joint activities to defend the biome and its peoples, with the participation of groups like the Pacari Medicinal Plant Coordination, the Cerrado Agroecology Nucleus (NACE), the Movement of Women Babaçu Nut Breakers (MIQCB, the Cerrados Indigenous Peoples' Mobilization (MOPIC) and the Cerrado Hub (Central do Cerrado[5]). This latter group, for example, coordinates business initiatives by extractive farmers in Northern Minas who, along with other Brazilian organizations, are producing goods based on the sustainable use of the Cerrado.

It is in this setting that proposals arise, from networking and dialogs underway for decades now, amongst traditional peoples and communities through their local and regional organizations. One major achievement, for example, has been greater civil-society participation in the public planning and evaluation of policies and for the rights of traditional peoples and communities.

Another major achievement was the creation and implementation of public policies like the Food Acquisition Program (PAA) and the National School Food Program (PNAE), which allow native products to be included in school lunches. Contracts signed by the Grande Sertão Cooperative alone with the National Food Supply Company (Conab) have benefited over 100,000 people – mostly children – with food sold from 2007-2011. Most of those people are from the very communities that supply the fruit and other products to the Cooperative, further reinforcing links with the region's culture.

Other initiatives include the National Plan to Promote Sociobiodiversity Product Chains (PNPSB) and the Floor-Price Guarantees for Sociobiodiversity Products (PGPM-BIO), which support

(4) See: www.redecerrado.org.br (5) See: www.centraldocerrado.org.br

agro-extractive producers through the conservation and use of biodiversity and the creation of income-generating alternatives using those products.

Other recent public policies have also sought to recognize and appreciate the role of family farmers and extractivists in the production of healthy food that helps conserve natural resources. One example is the National Agroecology and Organic Production Policy (PNAPO), aimed at bolstering various types of organization for family and peasant farmers and for traditional peoples and communities.

A State-wide mobilization of social movements in 2001 achieved the approval of State Law 13.965, which created the "Minas Gerais Program to Incentivize the Cultivation, Extraction, Consumption, Marketing and Processing of Souari Nuts (pequi) and Other Native Fruits and Products of the Cerrado", known as PRO-PEQUI. Later, another mobilization by agro-extractive businesses organized in the Souari Management Group, reorganized the Pro-Pequi Council provided for by that law. The Council works to promote favorable conditions for extractivists in the Minas Gerais Cerrado region, providing research-based orientation and infrastructure investments for the sector.

Strategies like these do make it possible for vast regions to survive with their socio-biodiversity. All the more so in Brazil, where 4.5 million people are living as traditional communities and peoples who occupy 25% of the country's land[6]. Despite their significant contribution to a new social and economic order, there are many victories yet to be won, particularly in terms of social organization for public policies that recognize these communities and peoples as a strategic sector of Brazilian society.

Photo: Arquivo CAA

(6) See: www.agenciabrasil.ebc.com.br/noticia/2006-08-02/comunidades-tradicionais-ocupam-um-quarto-do-territorio-nacional

The semi-arid region of Minas Gerais:
strategies for coexisting

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Photo: Arquivo CAA

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Coexistence with the semi-arid region and climate change

›› According to official data from the federal Ministry of Integration, Brazil's semi-arid regions cover 977,000 km² in 1,133 municipalities of nine States (Alagoas, Sergipe, Bahia, Rio Grande do Norte, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí), inhabited by 40 million people. In Minas Gerais, the semi-arid region covers 121,490.9 km², in the regions of Mucuri, Northern Minas and the Jequitinhonha Valley, three of the State's geopolitical divisions.

Historically, public policies and actions for Brazil's semi-arid regions have been restricted to specific climate-related actions, with no consideration for resistance or coexistence strategies rooted in community and family solidarity or reciprocity approaches. Actually, for decades now official programs have insisted on "fighting the drought," as if this natural phenomenon were something humans could fight. Following several experiences in coexistence by peasants in Brazil's semi-arid regions and disseminated by Brazil's Semi-Arid Coordination (ASA), even official programs have begun using the term coexistence (convivência), as they expand their work beyond just dealing with water shortages.

In Minas Gerais, for 15 years now the State Semi-Arid Coordination (ASA-MG) has been the forum for over 150 civil-society organizations from Northern Minas and the Jequitinhonha Valley actively implementing programs for coexistence with the semi-arid. ASA-MG is a member of the national ASA, with over 1,500 civil-society organizations from all of Brazil's semi-arid regions[3].

The cultures, flavors, knowledge and practices of coexistence with the region are important features that make it different from the prevailing approach, which perceives the semi-arid based on climate alone. According to Vanessa Araújo and Ribeiro,

> *(...) Since colonial times there are records of policies to confront the drought. At first they were actions to fight the drought based on food donations to alleviate hunger, or else repression against looting and riots by starving hordes. In 1833, still under the Empire, the first funds were granted to drill wells. That was the beginning of public programs to fight the drought (Araújo and Ribeiro, 2007, p.6)*

In the policy context for the semi-arid, the outstanding issue has always been water and rain. It seems obvious to say that the insufficient rainfall and water shortages are the region's

(3) www.asabrasil.org.br, dezembro de 2013

Photo: JR Ripper

key problems. For a long time – and in many cases, even today – the only official policies for the region have been what they still call "fighting the drought."

Major public works allied with social assistance – hand-outs, food distribution, water tank trucks, etc. – are presented as "acts of good will" while their subliminal purpose is to keep the semi-arid and its people in political submission. As long as it is submissive, the semi-arid will never dare to take up its own life and its own future.

That reading, however, does not portray the reality of the region as a whole. Beyond the shortage of sufficient rain is the fact that rainfall is concentrated in just part of the year and that there are no appropriate processes to store the water. Average yearly rainfall in the semi-arid varies from 200 to 800 mm/year. According to Galindo (2008), just storing that water adequately would solve the problem.

In addition to causing difficult living conditions, climate change and desertification processes have had a direct impact on food production. In response, heads of state and top authorities from 181 countries, at a conference on food and nutritional security held in Rome

in 2008 by the UN's Food and Agriculture Organization, declared that "It is essential to address the fundamental question of how to increase the resilience of present food production systems to challenges posed by climate change" (FAO, 2008)[4].

To that end, they went on, "We urge governments to assign appropriate priority to the agriculture, forestry and fisheries sectors, in order to create opportunities to enable the world's smallholder farmers and fishers, including indigenous people, in particular in vulnerable areas, to participate in, and benefit from financial mechanisms and investment flows to support climate change adaptation, mitigation and technology development, transfer and dissemination."

Brazilians who fight climate uncertainties every day of their lives, especially to feed their own families, have taught public authorities to rethink their programs and policies for coexisting with the country's semi-arid

Photo: Arquivo CAA

(4) http://www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/HLC08-Rep-E.pdf -- p. 50.

regions. Growing food with less water on less land, saving local landrace seeds and maintaining biodiversity have been a challenge for thousands of guardians in places where climate change is becoming clearer every year. They promote social technologies adapted to each situation, like home rooftop-fed cisterns, terrace-fed cisterns, underground dams, stone tanks and others.

The social technologies for collecting and saving seeds, water and food for families and small animals have been disseminated through programs organized by ASA and several other organizations active in Brazil's semi-arid region. They have been proven effective and necessary in the context of climate change. Recent surveys in the region have also identified the importance of further increasing the storage capacity of family farming systems, in order to enhance their resilience and capacity for adaptation. To that end, the families' and communities' capacity to stock adapted traditional and local seeds, as well as water and food, are at the core of sustaining their coexistence with the semi-arid.

Water is essential for life on Earth and fundamental to maintain biodiversity and food production. Life on our planet is threatened by economic development models whose impacts include climate change. We must rethink our production and consumption and adopt practices that bring us a different kind of development, based on approaches that conserve and protect agrobiodiversity and endangered forms of life.

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Agroecology, agrobiodiversity and resilience in the semi-arid region of Minas Gerais

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Photo: Elisa Costa

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›› The various dynamics displayed by agroecological approaches today in Brazil are a mosaic of its diversity as science, movement and practice. As a movement, led by a broad range of organizations and social movements, it is part of the ideological confrontation and political action to overcome agribusiness and build new paradigms, rooted in the farming, knowledge and ways of life of peoples in the countryside. As a science, using non-Cartesian/positivistic concepts, principles and methods, it goes about studying development processes from an ecological and socio-cultural standpoint, based on a systemic and holistic approach to agroecosystems as its unit of investigation and analysis. As a practice, it is experienced, tested, transmitted, renewed and (re) invented by a diversity of rural peoples, in different conditions and situations, throughout Brazil as a whole, whether it goes by that name or not (Fávero and Pacheco, 2013).

Photo: Arquivo CAA

Agroecology and resilience

From the standpoint of agroecology, the degree of agricultural sustainability depends on the use of strategies that take into account interrelations between (natural) ecosystems and (traditional) agroecosystems. It also aligns with the understanding that natural systems evolve by responding to cultural pressures and tend to reflect the values, world view and social organization of peoples living in a specific location (Norgaard, 1989).

The principles that govern the conception and management of agroecological systems include: maximizing natural processes and cycles (energy, nutrients, organic matter, biotic interactions); recovering, enhancing and conserving renewable natural resources (soil, water, biodiversity); using less and gaining independence from non-renewable natural resources (fossil fuels, synthetic fertilizers); reducing consumption of outside inputs and doing without dangerous inputs (pesticides, GM seeds, anabolic steroids). The management and conservation of biodiversity are both essential to agroecology.

A system's resilience lies in its ability to remain whole under long-term disturbances and pressures, in contrast to resistance, which is a system's ability to remain stable in the face of the very conditions of its existence and minor, short-term variations (Holling, 1996, quoted by Marzall, 2007). In agroecosystems, for example, resistance is the system's capacity to maintain certain yields and profitability when the output of a given species or the market value of a given product declines. An agroecosystem, meanwhile, is clearly resilient if it for example is able to persist, even when a given species' output is totally compromised by ecological disturbances or when the system becomes less profitable due to the absence of appropriate public policies.

In the climate context, agroecosystems may have varying degrees of resistance to adverse local conditions (water deficits, for example) and varying degrees of resilience to longer-term climate change (higher average temperatures, concentration of rainfall, longer droughts, etc.). Agroecosystems that are set up and managed by peasant farmers and traditional peoples, based on the principles of agroecology, display high degrees both of diversity of species and of intra-species variability. These features provide for differen-

tiated ways of occupying the edaphic space and infinite possibilities for using the soil, water, air and sunlight, as well as interactions among the flora and fauna (synergisms, complementarities, cooperation, etc.).

Mixed varieties, consortia, crop rotation, polycropping, agroforestry systems, and integrated crop-livestock approaches are all examples of practices and systems used by peasants which, when compared to monocrop production systems dependent on external inputs, are more adapted and resistant to local conditions and display greater resilience to climate changes, in addition to providing ecological services such as reducing the emission of greenhouse gases, which are the main culprits for climate change (Altieri and Nicholls, 2012, quoting Holt-Giménez, 2000; Lin, 2007; Philpott et al., 2008 and Rosset et al., 2011).

As noted by a Special Report to the United Nations Human Rights Council, agroecological systems contribute

"to mitigating climate change, both by increasing carbon sinks in soil organic matter and above-ground biomass, and by avoiding carbon dioxide or other greenhouse gas emissions from farms by reducing direct and indirect energy use." (United Nations, 2010, p. 13).

One of the unique environmental conditions of the semi-arid region of Minas Gerais is the meeting of three major Brazilian biomes: the Atlantic Forest, the Cerrado (Cerrado) and the Caatinga (dryland brush). In some places, over small distances, one finds remnants with the different features of each of the three biomes, plus intersections and transitions between them. The region thus offers a great diversity of fauna and flora, expressed in an extensive agrobiodiversity associated with species introduced by family farming systems practiced by traditional peoples who have lived there for centuries, making it unequaled in all of Brazil.

The semi-arid region of Minas Gerais has been settled by traditional peoples and communities harking back to indigenous, Afro-descendants and immigrants from several other regions, due to the history of territorial occupation by the variety of ethnic, cultural and social groupings that make up the region's peasantry[4] (Soares, 2000; Costa, 2011). The agriculture practiced by these groups also displays a notable diversification in products and systems, oriented both for subsistence consumption and for sale on local markets, particularly at farmers' open-air markets for food and crafts make from native flora products. The multiplicity of agricultural and agro-extractive approaches in use there relates to the ways of life of these peoples who have historically found their own ways to interact and coexist with the diversity of environments they inhabit.

These groups work with a broad diversity of species and varieties used and managed in their cropping and livestock systems, including the native flora associated with their agroforestry and silvopastoral systems. There is widespread knowledge of the native flora and fauna, including their habits, habitats and occurrence and their multiple uses and meanings. They are part of the peoples' strategies for food, housing, handicraft utensils, medicinal and religious practices and also their

(4) There is a variety of self-named peasant identies, including geraizeiros, catingueiros, chapadeiros, sertanejos, veredeiros, vazanteiros and wild-flower gatherers, in addition to indigenous and Maroon peoples

livelihoods. Complex knowledge systems associated with the use, management and conservation of this agrobiodiversity indeed nurture life in the semi-arid region of Minas Gerais. Today, all this wealth is threatened by the spread of agribusiness with its monocrop systems (eucalyptus, cotton, pastures, etc.) and genetically modified (transgenic) crops, as well as by major mining and hydropower works, and even by environmental compensation projects in league with those works.

According to the Synthesis Report by the Intergovernmental Panel on Climate Change (IPCC, 2007), the planet's semi-arid regions will be especially affected by global climate change. It warns that changes in water and temperature patterns will alter the calendar for agriculture, bringing strains on present-day agro-food strategies. These effects and impacts are already being observed and felt in the semi-arid region of Minas Gerais by farmers who suffered up to 100% crop losses in the last rainy season (2012-2013 summer). Due to changes in rainfall patterns in the region, some families seeded – and lost – their crops three times in a single year.

Meanwhile, the peasants' mastery over and knowledge associated with the agrobiodiversity of the semi-arid region of Minas Gerais and with the complexity of agro-extractive systems developed there are factors that make it possible to conserve, establish and manage production systems based on the principles of agroecology. Here, the diversity of plant and animal species for food and agriculture adapted to local edafoclimatic conditions and incorporated into production strategies, plays a vital role in the resilience of those agroecosystems.

Surveys of peasant families and field observations have shown that the use and management of landrace and traditional species and varieties and, in particular, of consortia and agroforestry and silvopastoral systems, produce more resistance to the attack of pests and blights and to higher temperatures, in addition to persisting longer during prolonged dry seasons

Photo: Arquivo CAA

and in the presence of water shortages, with a greater capacity for maintaining agricultural production. Although they demand greater and deeper knowledge and understanding about intrinsic processes, these systems are resilient to climate change and point the way to agro-food and food sovereignty strategies for these peoples.

Both climate change and recent socio-economic changes in the semi-arid region of Minas Gerais place strains on peasant families' agro-food strategies and demand a redesigning of traditional farming systems to expand their resilience and thereby enhance the food sovereignty of local peoples and communities. This will require, however, a combination of traditional practices and values with new knowledge, in order to adapt to climate change with the aid of important features present in peasant production systems.

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The Minas Gerais semi-arid agrobiodiversity network and the FAO/CAA-NM Project: experiences, prospects and challenges

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» The semi-arid region of Minas Gerais accounts for 10.54% of all of Brazil's entire semi-arid region. 37.9% of its population lives in rural areas. In absolute numbers, that means 820,107 people out of a total population of 2,165,636 inhabitants, in a region that covers approximately 103,590 km², spread over 85 municipalities in Northern Minas Gerais and the Jequitinhonha River Valley. Compared to the rest of Minas Gerais, and to Brazil as a whole, this region has one of the highest shares of family farmers in its population and one of the lowest scores on the Human Development Index (below 0.65).

The landscape features a mosaic of ecosystems, much biodiversity and differentiated territorialities created by traditional peasant and indigenous peoples and communities. The communities still manage and conserve a significant gamut of plants and animals for food, medicine, energy, fibers and other uses, both for family and community consumption and for sale.

With its rainfall spread irregularly throughout the year, and varying on the average from 300 to 800 mm/year, the semi-arid region of Minas Gerais has already felt the impact of climate change. The region's rural population is worried by the climate changes that have cost them a considerable part of their crops in the past two rainy seasons (2011/12 e 2012/13) and reduced both family and community food stocks. Many farmers had total losses, including their seed beds and participatory breeding fields, leaving families even more vulnerable to the process of climate change and increasing the risk of food and nutritional insecurity.

Such situations can dismantle agro-food strategies and thereby increase the food insecurity that already afflicts many of those families. In response, it is fundamental to mitigate the effect of climate change with coordinated strategies to manage water and plant genetic resources for agriculture and food, adapted to local conditions and with measures to enhance the resilience of agroecosystems. At stake are the climate, agrobiodiversity, food security and sovereignty for local communities and farmers' rights, overlapping issues that demand both emergency and systemic actions.

THE FAO/CAA-NM PROJECT (PR-26-BRAZIL)

In response to those challenges, the project entitled "The use and shared management of agrobiodiversity by traditional peoples and communities in the semi-arid region of Minas Gerais as a strategy for food security and to reduce climate risks" set out the objective of developing a strategic action plan. The process of reflection, discussions, action and construction of those strategies examined the use and shared management of agrobiodiversity, along with local groups' socio-economic conditions and cultural characteristics.

The process involved several steps: evaluation of the region's climate change situation; analysis and evaluation of agro-food strategies developed over time by farmers and traditional peoples in the semi-arid region of Minas Gerais; collective reflection and joint formulation of strategies, considering tensions affecting both farm systems and families' food sovereignty in the context of climate change and of farmers' rights under the ITPGRFA.

Training workshops were held during the Project, with researchers, technicians and farmer guardians of agrobiodiversity. There were field visits to assess plant genetic resource management initiatives in the region and in other countries, followed by regional and national meetings to discuss and draft proposals for strategic action plans and a regional gathering on agrobiodiversity with national and international guests to discuss and validate those proposals, as well as several meetings by the projects steering committee.

The priority during all those stages has been training key players, through collective reflection and interaction with other groups, organizations and experiences in agrobiodiversity management. Another priority was networking among participating social players, since the problems demand actions on different scales, ranging from family farms to public policies and territorial, economic, social, cultural and environmental rights.

By connecting the two different areas (Northern Minas and the Jequitinhonha Valley) that make up the semi-arid region of Minas Gerais, in order to work together on actions in their common interest, the project created a significant opportunity for exchanging experiences in local agrobiodiversity management. It also led to the circulation of plant genetic resources and the irradiation of

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several local initiatives.

As part of the field work during the workshops, visits to reference farms and centers allowed participants to evaluate local farming systems and plant genetic resources adapted for greater resilience to climate change, as well as to discuss notions of risks and vulnerability to climate change and to enhance techniques for the use, management, conservation and circulation of plant genetic resources for food and agriculture. As the groups gained skills around the issues, they brought in new aspects to their planning of actions to strengthen the resilience of their own agro-food systems. The approach also provided them with access to more technical and practical information and experiences.

They also debated strategies for: the conservation, sustainable production, storage, distribution and marketing of plant genetic resources for food and agriculture; public policies for climate change and for the distribution of landrace/local seeds; food sovereignty and farmers' rights under the ITPGRFA (including the Multilateral System of Access and Benefit Sharing). The workshops have also promoted coordination among various organizations that now work together in dozens of municipalities to affect public policies on various scales for the issues they raised. Another key aspect was the quality of discussions, enriched by the diverse outlooks

of different social segments present at the workshops.

The process sought to strengthen existing local activities around the on-farm production, use, conservation and circulation of traditional and native seeds, for example: family stocks, community seed banks, seed beds and participatory breeding of adapted seeds, community and national germplasm banks, coordination with public food supply programs (particularly the Food Procurement and School Meals Program), farmers' markets, agro-extractivism, and others. To help expand the network of social organizations involved in this struggle, the Agrobiodiversity Network of the Semi-Arid Region of Minas Gerais has been woven into a rich process of social, cultural, political and economic interactions.

Effective participation by family farmers, representatives of traditional communities in the region, indigenous peoples and quilombolas was achieved throughout the project, as well as the participation of technicians, scientists from federal research institutes, public officials and students. Through shared decision-making and participatory intervention methods, allowing for the interaction of different forms of knowledge, joint solutions emerged.

The process has inspired other regions and organizations in Brazil and abroad, as well as debates on new food security approaches and strategies, and new ways to confront the impacts of climate change with strategic projects on the sustainable use and management of agrobiodiversity.

AUDIENCE

The PR-26-Brazil Project has benefited 700 people directly, and another 5,000 families indirectly, on family farms and in traditional peoples and communities. These groups' direct involvement in evaluating and systematizing current initiatives, particularly the agrobiodiversity guardians, helped make the process work better. It has reaffirmed the power of direct interaction among farmers to proliferate farming initiatives more resilient to climate change as well as the circulation of plant genetic resources.

Women have played a fundamental role in maintaining the agrobiodiversity and food security of families in Northern Minas and the Jequitinhonha Valley. They are responsible for a good share of the cultivation, management and storage of food stuffs consumed by families, as well as for gathering native fruit

and herbs. There are more women than men raising small animals and they also take part in caring for cattle. They are active in the circulation of genetic resources among families and neighbors and also in feeding their own families, using a broad range of knowledge associated with the rich local cuisine.

There were also initiatives to involve young people, through ties with local schools, during the project's workshops. That approximation expressed the vision of a need to share knowledge and skills over generations. The participation of both women and youth raised the need for appropriate strategies and methodologies to assure their effective participation and for differentiated approaches and actions to respond to their respective interests.

EXPERIENCES

The traditional peoples and communities of the semi-arid region of Minas Gerais produced the Strategic Action Plan for the Shared Use and Management of Agrobiodiversity through a broad, participatory process. Activities from November 2012 to October 2013 included:

- **November 2012 to February 2013:** composition of the group of organizations and guardians responsible for the project's shared management. Conversations and interaction with networks of partner organizations: Coordination of the Semi-Arid Region of Minas Gerais (ASA/MG), National Agroecology Coordination (ANA), Minas Gerais Agroecology Coordination (AMA), Cerrado Network and National Commission of Traditional Peoples and Communities.
- **January 2013:** National Seminar on Climate Change. First activity organized as part of the Plan, bringing together farmers, technicians, researchers, students and public officials. This activity revealed the dramatic situation of crop and seed loss caused by repeated droughts in recent years. Researchers presented outlooks for the region's climate and agriculture and revealed the absence of research on traditional crops in the semi-arid region.
- **February to July 2013:** visits to families throughout the region by the project's technical staff and agrobiodiversity guardians, to evaluate current initiatives and to develop strategies for sharing the management of agrobiodiversity, food sovereignty and the resilience and adaptation of farming systems. The visits were programed to cover a sampling

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of different criteria: cultural territories (ethnically and culturally differentiated groups); overlapping biomes (technically classified as Savannah, Steppe Savannah, Dry and Atlantic Forests); density of agrobiodiversity; differentiated natural systems representative of approaches to agrobiodiversity management; vulnerability, risk and resilience to climate change.

- **March 2013:** workshops mobilizing the regions of Serra Geral (in Porteirinha/MG); São Francisco Lowlands (on the Xacriabá/MG indigenous reservation) and Jequitinhonha Valley (in Araçuaí/MG). The workshops promoted dialogs between the local and the technical/scientific knowledge systems, to assess the outlook for climate change in the region and plan strategic actions to strengthen current local initiatives, reduce risks to family and traditional agriculture and assure the families' food sovereignty.
- **April 2013:** exchange with Central America, in two stages. First in Honduras, based on the partnership between the Northern Minas Alternative Agriculture Center (CAA-NM) with Hilfswerk der Evangelischen Kirchen Schweiz (HEKS); and then in Guatemala, with the participation of seed organizations and networks from Brazil, Panama, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Mexico. That gathering shared experiences with municipal laws

against GMOs, participatory plant breeding with landrace varieties and methodologies for farmer-to-farmer work.

- **June 2013:** National Seminar on Farmers' Rights, in Luziânia/GO, in partnership with the Biodiversity Working Group and the National Agroecology Coordination, with the presence of organizations and farmers from around the country. The seminar forged a broad understanding about international and Brazilian legal frameworks on seeds, particularly articles 5, 6 and 9 of the ITPGRFA (International Treaty on Plant Genetic Resources for Food and Agriculture), which recognize the contribution by farmers to the conservation of agrobiodiversity and their rights to freely use, exchange and reproduce their seeds.
- **July 2013:** expanded workshop to discuss the strategic action plan for agrobiodiversity in the semi-arid region of Minas Gerais, based on the contributions gathered throughout the Project.
- **August 2013:** Gathering of the Agrobiodiversity Guardians, an important moment to materialize the plan and to reinforce activities for the region's agrobiodiversity. The guardians presented the outcome of their local field research to the technicians, researchers and students. The gathering demonstrated the importance of food culture and of maintaining the different groups' traditional territories for the conservation of agrobiodiversity and to assure the families' food sovereignty.
- **September 2013:** second expanded steering-committee workshop, with the reading and approval of the Strategic Action Plan for the Shared Use and Management of Agrobiodiversity in the Semi-Arid Region of Minas Gerais.
- **October 2013:** conclusion of the organization of information and public discussion on the strategic action plan, during the 6th Northern Minas Agrobiodiversity Encounter, the 1st Agrobiodiversity Encounter of the Semi-Arid Region of Minas Gerais and the 1st International Forum on Agrobiodiversity and Climate Change, focused on the theme "Agrobiodiversity: Climate Change and Farmers' Rights." The gathering brought together nearly 700 participants in Montes Claros/MG, including men and women farmers, indigenous people, youth, professors, students, technicians, researchers and public authorities from all levels of government. There were representatives from technical cooperation agencies and organizations from Colombia, Costa Rica, Honduras, Guatemala, Mexico and Brazil. The plan was approved and there

were broad-ranging exchanges of experiences, information and seeds among the farmers. They also highlighted several initiatives already underway and reaffirmed farmers' rights and the risks of introducing GM seeds into the region, as a threat to peasants' autonomy and national food sovereignty.

ACHIEVEMENTS AND CHALLENGES

Throughout those experiences, certain aspects pointed to potential pathways, but there are still major challenges. Agrobiodiversity and, consequently, food security were confirmed as essential for crops to resist environmental stress factors, which are intensified by climate change. It is fundamental to defend traditional communities' ways of life and territories, to value their knowledge and their food culture and to maintain and expand the biodiversity managed by farmers. It is also essential to strengthen strategic channels for the circulation of plant genetic resources for food and agriculture, particularly at municipal farmers' markets and regional agrobiodiversity fairs.

The perception of agrobiodiversity as a cultural heritage has inspired fruitful reflections and can be a new tool for safeguarding traditional knowledge and territories. It is yet another resource to mitigate the impacts of climate change on traditional peoples' and communities' farming systems. It is also essential, though, that the communities have access to information, local plant genetic resources and innovative technology, especially today when their food strategies are being stretched both by the loss of family and community farming areas and by the advent of climate change.

The project's experience has made it clear that today's many and varied local initiatives in the on-farm production, use and conservation of agrobiodiversity (including traditional seeds, adapted varieties and the use/gathering of native species) must become the foundation for future activities. They have proven that working with local ecosystemic, socio-economic and cultural potentials helps conserve both local biodiversity and the economic livelihoods of peasant families.

Likewise, interaction among different knowledge systems, through dialog

and exchanges, ensures a meaningful sharing of skills and expansion of activities. To that end, the project's various stages prioritized the training of participants, using methodologies to promote their interaction, thus enriching the process and facilitating their access to information, in addition to disseminating a variety of initiatives and viewpoints, along with plant genetic resources adapted to local conditions.

In institutional terms, the project's shared management has been fundamental for regional coordination and for achieving links of trust amongst the partners. National and international exchanges among institutions open up prospects for coordinating collective activities in diverse decision-making arenas. Coordination amongst institutions enhances their capacity to act for the creation of appropriate and sustainable approaches to food and agriculture, for today and for tomorrow.

Interaction amongst organizations and people from different continents – Latin America and Africa, in a South-South relationship – can give rise to dialog, inspire and weave together historically subordinated groups, at vital moments in their development. It is important to promote such interaction amongst socio-technical networks on regional, national and international scales, forging connections based on their experience, their plans and their difficulties in using and conserving plant genetic resources in Brazil and in the world.

Implementing the ITPGRFA (International Treaty on Plant Genetic Resourc-

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es for Food and Agriculture) in Brazil, through dialog with organized civil society, is a major outstanding challenge. The issue is not necessarily a priority for governments and it mobilizes private-sector interests in an unequal balance of forces. The concern is that doing nothing may compromise farmers' rights to freely use and access cultivated and managed biodiversity.

Public policy making on seed legislation and regulations for access to genetic resources and associated traditional knowledge is another challenge, because intellectual property rights work against farmers' rights. We therefore emphasize the care needed to maintain and stimulate ongoing dialog and converging actions, such as we have seen in the Agrobiodiversity Network of the Semi-Arid Region of Minas Gerais.

The present situation in the semi-arid region of Minas Gerais requires a redesigning of agrofood strategies, to reduce the vulnerability of families and strengthen their food sovereignty. This demands more resilient farm systems, oriented by agroecological principles and by the shared use and management of agrobiodiversity, and the assurance of farmers' rights to the free use of that agrobiodiversity, and of the human right to secure and appropriate food supplies.

We must now turn our attention to putting local actions into practice and having an impact on the powers that regulate life-producing territories where, through a diversity of processes, humans interact with natural resources. Agrobiodiversity must be asserted as the agricultural legacy of traditional peoples and communities, whose knowledge and labor associated with those processes must be recognized and valued by society at large, and uplifted to play their full potential roles in the challenging days to come.

Photo: Arquivo CAA

STRATEGIC ACTION PLAN

for the shared use and management of (agro) biodiversity by tradicional peoples and communities in the semiarid region of Minas Gerais

FOCUS 1: INTEGRITY OF TERRITORIES AND OF CULTURAL AND ECOLOGICAL LANDSCAPES

- Improve knowledge of the territory and the capacity to monitor the evolution of its settlement, activities and impacts.
- Defend and strengthen the peoples'rights to their territories and to use their resources.

FOCUS 2: ADAPTATION TO CLIMATE CHANGE

- Monitor and publicize climate-change dynamics in the semi-arid region.
- Assess the regeneration capacity of ecosystem and water resources.
- Enhance the capacity of communities and their farming systems to assure food security in the semi-arid region of Minas Gerais (resilience).

FOCUS 3: USE AND CONSERVATION OF (AGRO)BIODIVERSITY

- Highlight, produce and disseminate knowledge about the potential of agrobiodiversity.
- Expand local strategies for using and conserving agrobiodiversity.
- Strengthen and expand Community Seed Banks in coordination with home seed stores and through shared management with public ex situ conservation centers.
- Disseminate agroecology production systems.
- Enhance the carrying capacity of integrated farming, livestock and extraction systems.
- Field study and dissemination of the use of agrobiodiversity for food and nutritional security and for health.
- Expand opportunities for income generation from products of the region's agrobiodiversity.

FOCUS 4: PUBLIC POLICIES AND REGULATORY FRAMEWORK

- Expand involvement in and impacts on policies for the use and conservation of agrobiodiversity, adaptation to climate change, FNS and territorial rights.
- Improve laws and regulations to assert farmers' rights and assure the use and conservation of agrobiodiversity.

FOCUS 5: ORGANIZATION, PARTICIPATION AND STRONGER INSTITUTIONS

- Expand and strengthen training activities on the use and conservation of agrobiodiversity, particularly in local communities.
- Heighten the participation of women and young people.
- Promote and strengthen networks for the use and conservation of agrobiodiversity.
- Upgrade the information system on the use and conservation of agrobiodiversity and the impacts of climate change: create a data base on the region's agrobiodiversity.
- Develop better tools for awareness building and sharing information with the public at large.

agrobiodiversity network
semi-arid of Minas Gerais

Guardiões e Guardiãs da Agrobiodiversidade do Semiárido Mineiro
Centro de Agricultura Alternativa do Norte de Minas
Articulação Semiárido Mineiro
Cáritas Regional de Minas Gerais
Fórum de Convivência com o Semiárido do Vale do Jequitinhonha
Centro de Agricultura Alternativa Vicente Nica
Visão Mundial
Cáritas Diocesana de Almenara - Baixo Jequitinhonha
Cáritas Diocesana de Araçuaí
Cáritas Diocesana de Januária
Cooperativa Grande Sertão
Sindicato dos Trabalhadores Rurais de Riacho dos Machados
Sindicato dos Trabalhadores Rurais de Porteirinha
Sindicato dos Trabalhadores Rurais de Rio Pardo de Minas
Sindicato dos Trabalhadores Rurais de Varzelândia
Associação Indígena Xacriabá Aldeia Barreiro Preto
Grupo Agroextrativista do Cerrado
Articulação Rosalino de Povos e Comunidades Tradicionais do Norte de Minas
HEKS - Cooperação Internacional
Action Aid Brasil
Núcleo de Agroecologia e Campesinato da UFVJM
Groups of researchers at EMBRAPA Cerrados and CENARGEN, Instituto de Ciências Agrárias at the UFMG, UNIMONTES and Institut de Recherche pour le Développement.

PARTNER NETWORKS

Articulação Nacional de Agroecologia (National Agroecology Coordination), Articulação no Semiárido Brasileiro (Brazilian Semi-Arid Coordination), Articulação Mineira de Agroecologia (Minas Gerais State Semi-Arid Coordination), Rede Cerrado (Cerrado Network), Comissão Nacional de Povos e Comunidades Tradicionais do Brasil (National Commission of Traditional Peoples and Communities in Brazil).

EXECUTION:

SUPPORT: