

**TRADITIONAL AGRICULTURAL SYSTEM IN THE SOUTHERN
ESPINHAÇO RANGE, MINAS GERAIS (BRAZIL)**



Minas Gerais, Brasil

December, 2019

Comissão em Defesa dos Direitos das Comunidades Extrativistas – Apanhadoras de Flores Sempre-Vivas (CODECEX), 2019

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This document contains a proposal for the recognition of this Agricultural Heritage System, a plan for its dynamic conservation and related attachments. The Dynamic Conservation Plan was produced through a participatory process, with input from local (community) and regional workshops involving approximately 200 people representing communities, technical advisors, researchers, partner organizations and municipal, state and federal governments.

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Provisional Template for GIAHS Proposal

I. SUMMARY INFORMATION

Name/Title of the Agricultural Heritage System:

TRADITIONAL AGRICULTURAL SYSTEM IN THE SOUTHERN ESPINHAÇO RANGE, MINAS GERAIS (BR)

Requesting Agency/Organization:

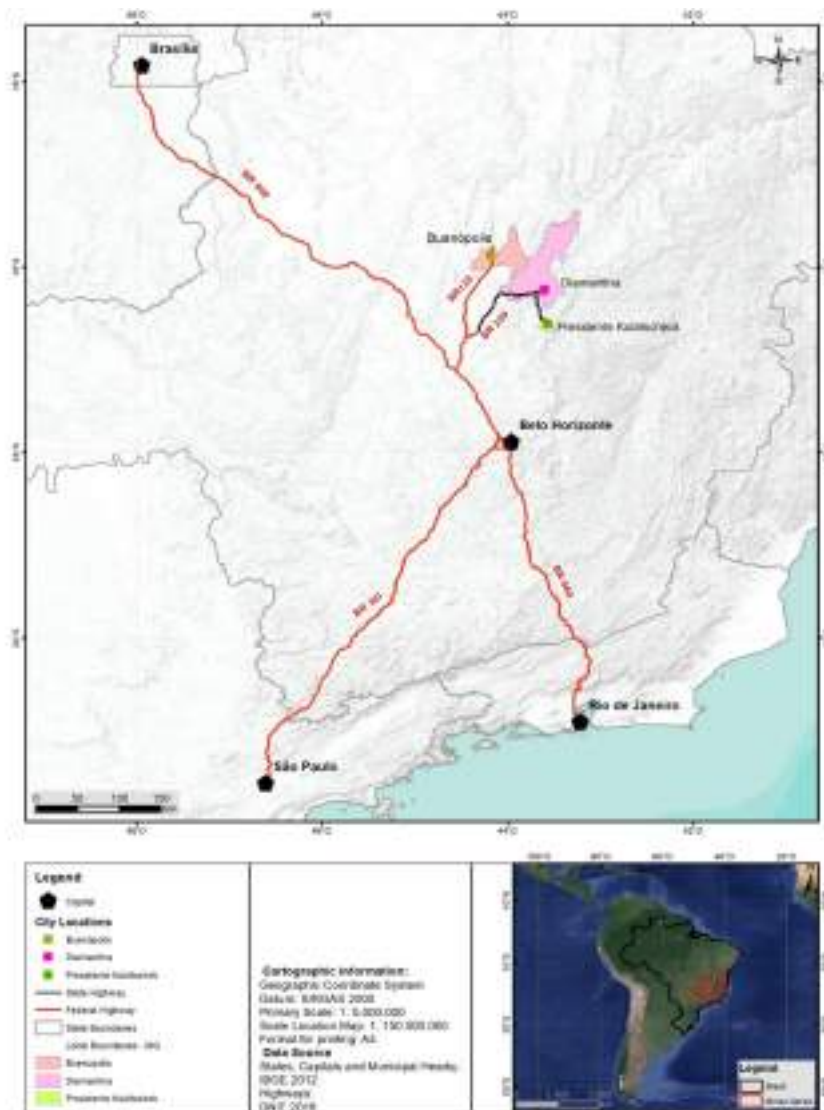
Commission for the Defense of Sempre-viva Flowers Gatherers' Communities – (CODECEX) with support from the Minas Gerais State government and the municipal governments of Diamantina, Buenópolis and Presidente Kubitschek.

Responsible Ministry (for the Federal Government):

Ministry of Agriculture, Livestock and Supply - Secretariat for Family Agriculture and Cooperativism

Location of the Site:

The proposed GIAHS site is in central Minas Gerais, Brazil, in the municipalities of Diamantina, Buenópolis and Presidente Kubitschek. This GIAHS occurs in this region and at present 6 localities/communities are organized and proposing to be recognized as a GIAHS site.



Accessibility of the Site to Capital City or Major Cities:

The site is 360 km from Belo Horizonte, capital of Minas Gerais: 300 km on paved road and the rest on unpaved road. Access is possible by car, bus or air. For airplanes, there are commercial flights to the capital of Minas Gerais (Belo Horizonte) and from there to Diamantina, which has a regional airport. One can also make the journey from the city of Belo Horizonte to Diamantina by land.

Area of Coverage:

Approximately 100,000 hectares, covering the 6 localities/communities that make up the site.

Agro-Ecological Zones¹ (for Agriculture, Forestry and Fisheries):

Most of the topography is covered by mountainous highlands, whose average altitude is 1,400 meters, in the region of Diamantina, and a minimum of 600 meters. The central part of the highlands is the highest, in the *Diamantina Plateau*, with a flattened relief permeated by quartzite rocks and a predominance of shallow, sandy and dystrophic soils. At the edges there are steep scarps and steps. The scarps descend to 600 meters, where there are larger waterways, with a soft-wavy relief, sandy-clay and dystrophic soils.

Topographic Features:

The Traditional Agricultural System in the Southern Espinhaço Range (*Serra do Espinhaço Meridional* – Minas Gerais/BR) comprises environments of flattened fields in the high-altitude areas (1,400 m), and adjoining ridges, steep slopes and deep valleys, intersected by water bodies, reaching plains in the landscape's lowlands (600 m), where there are drainage areas near the river beds.

Climate Type:

The high-altitude climate is Cwb, using the Köppen classification, typical of highlands with summer rains. The average annual temperature is 18.7° C, with cold, dry winters and mild, humid summers. Average annual rainfall is 1,500 mm.

At 600 m., the climate is Cwa, using the Köppen classification, with rain and high temperatures in the summer, while the winter is dry, with lower temperatures. The average annual temperature at this altitude is 22.5° C, and average annual rainfall is 1.170 mm. The dry and rainy seasons are well defined, lasting six months each, with the dry season from May to October, with less than 50 mm of rainfall during the driest month.

Approximate Population (Beneficiary):

Approximately 1,500 individuals.

Ethnicity/Indigenous population:

Traditional communities descending from indigenous peoples, Europeans and Africans enslaved in Brazil until 1888.

¹ Agro-ecological zones are defined by FAO as homogenous and contiguous areas with similar soil, land and climate characteristics.

Main Source of Livelihoods:

Agriculture, livestock and non-timber forestry products native to the savannah biome (Brazil's *Cerrado* region).

Executive Summary (one page approximately):

In Brazil, the *Serra do Espinhaço* (Big Spine or Espinhaço Range) is the country's only mountain range, making it an important geographic, historical and cultural reference in Minas Gerais State. It is the divide between two of Brazil's major river basins, has outstanding biodiversity endemism and was long settled by indigenous peoples (for at least 10,000 years), until the arrival of Portuguese and African immigrants during colonial times, in the late 1600s. The rural communities now living in the southern portion of the Espinhaço Range in Minas Gerais represent the coming together of those agri-cultures. Today's agricultural system is the outcome of co-adaptation, which has evolved in the area over time.

The Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais, is located in a Brazilian Savannah region, with a transition area to the Atlantic Forest in the east. Its great diversity of edaphoclimatic conditions varies from highlands (1,400 m), to steep slopes and deep valleys, intersected by water bodies at lower altitudes (600 m), where there are drainage areas near the river beds. There is a predominance of sandy, shallow and dystrophic soils at high altitudes and dystrophic sandy-clay soils at low altitudes. The climate in the high fields is Cwb (as per Köppen) with an average annual temperature of 18.7° C, and average annual precipitation of 1,500 mm. At lower levels (600m), the climate is Cwa (Köppen), with an average annual temperature of 22.5° C and annual average rainfall of 1,170 mm. Semi-arid conditions prevail in this lower part of the landscape.

The complexities of *verticalities* and *horizontalities* in the system's landscape confer *elasticity* and *flexibility* to local agri-food strategies. This system combines different altitudes, soils, climates and much biodiversity associated with different edaphoclimatic characteristics and a wide range of traditional knowledge on the use of these natural resources, generating different agro-environments. The system has also gone through adverse social, political, economic and environmental situations. As a result, we have unique managed landscapes, abundant water, a hotspot of native biodiversity, vast agrobiodiversity and considerable cultural density.

In practice, the combination of agriculture, grazing and extractivism in the system

developed here has given rise to polycultures controlled by rural families in areas of native vegetation; agroforestry gardening with a high density of food species and small animals of local breeds raised around the houses; larger rustic livestock in native fields on common-use lands in the highlands; and extraction/management of native flora species at different altitudes for food, traditional medicine, festivities, domestic construction and ornamental plants for sale. These communities' *traditional way of life* feeds a rich agricultural and biocultural heritage in a beautiful managed landscape.

The cultural identity of the “sempre-viva flowers gatherers” (*apanhadores de flores sempre-vivas*, as they call themselves) is rooted in a sense of belonging to this vast territory and the socio-cultural practices developed in the *campos rupestres* (characterized by their rupestrian grassland in savanna vegetation) of Brazil's *Cerrado* biome. The communities' territorial practices combine contained environments at higher altitudes (in the common-use lands at 1,400 m, mainly for native flowers gathering and livestock grazing on native vegetation) with “foothill” activities (at 600 m, where they practice traditional agriculture and raise small animals). Their seasonal movements express the transhumance of families and local groups, overcoming agro-ecosystemic limits and exploiting many of the region's different potentials.

Food production depends on agro-food strategies structured within this combination of agro-environments, traditional knowledge, food culture and the shared management of adapted genetic resources and water (considered to be common goods). In addition, in the agrarian regime is characterized by common-use land and by knowledge and rites associated with agro-biodiversity. The system's techniques are thus adaptable to adverse conditions, and have been developed from to use the ecosystems' entire potential, enabling a significant degree of food security for the groups, while also generating income and socio-ecological resilience. The strong communities' social and political organization also helps keep this system alive, in the face of constant challenges, even today. Nowadays they have their own social organization, the Commission for the Defense of Sempre-viva Flowers Gatherers' Communities (CODECEX).

Their life strategies have developed based on a wide range of complex traditional knowledge, capable of working with very diverse environments and species of flora and fauna. This knowledge has been handed down and adapted over many generations and has ensured the lives of families and communities over time, in adverse situations. It represents

social practices of interaction with nature – the creator of life and a whole of which these peoples are part. The uses of these environments have developed and evolved over centuries of working and interacting with them. They are managed landscapes that constantly co-evolve with the communities that depend on them.

II. DESCRIPTION OF THE AGRICULTURE HERITAGE SYSTEM

II.1. Significance of the Proposed GIAHS Site

Brazil is the world's fifth largest country, with 8.5 million square kilometers, occupying almost half of the South American continent. Brazil is also the most populous country in South America, with a population of more than 207 million inhabitants, 85% of whom live in urban centers. The country has six different ecosystems (biomes²), one of them being the *Cerrado* (Brazilian Savannah), which occupies about 25% of the nation's land mass (IBGE, 2010).



Figure 1 – Brazilian *Cerrado* Region (IBGE, 2018)

The Cerrado biome is rich in biodiversity and its flora has many different potentials for food, medicines, forage, ornaments, crafts, timber, apiculture, spices, oil seeds and many other uses.³ In addition, the biome is in the center of Brazil, known as the “cradle of the country's waters”. Indeed, it is responsible for recharging aquifers, and its springs contribute to the formation of eight of Brazil's 12 largest river basins, three of which are simply the largest in South America: Amazon/Tocantins, São Francisco and Prata. It is the most biodiverse savannah on the planet and plays a very important role in regulating the region's

² A spatial grouping of a given order and territorial greatness, under a given morpho-climatic and phyto-geographic domain. Such features refer to concept of *core area* – in which physiographic and bio-geographic conditions make up a relatively homogeneous and extensive complex (AB'SABER, 2003).

³ According to the Ministry of the Environment (2018), there are 11,627 species of native plants listed in Brazil's Cerrado (savannah). Among the fauna, 199 species of mammals are known, 837 species of birds, 1,200 species of fish, 180 species of reptiles and 150 species of amphibians. According to recent estimates, the Cerrado is a refuge for 13% of the butterflies, 35% of the bees and 23% of the termites in the tropics.

rainfall. The Cerrado has long been home to many indigenous peoples, *quilombola* communities and traditional communities, such as the sempre-vivas flowers gatherers. This biome,⁴ therefore, is of great sociocultural importance as part of Brazil's historical and cultural heritage (MMA, 2018).

Even as one of the world's biodiversity hotspots, with an extreme abundance of endemic species, the Cerrado has undergone a severe loss of habitat. When Brazilian agriculture began to modernize in the 1960s, the Cerrado was the great farming frontier for industrial agriculture (mainly for grain and meat production for export to Europe, the US and Asia). Only 54% of its original plant cover remains today (MMA, 2018). From 2002 to 2011, monocrops advancing on the Cerrado overran some 10.6 million hectares of forest, an area more than twice the size of Switzerland. As a result, in 2014 land-use change and agriculture contributed, respectively, 49% and 21% of Brazil's gross greenhouse gas (GHG) emissions.⁵ The rate of deforestation in the *Cerrado* is 2.5 times greater than in the Amazon, and rainfall in the *Cerrado* has declined by 8.4% in three decades.⁶

The intensification of agriculture also meant an increase in the use of chemical inputs. Since 2008, Brazil has been the world's leading consumer of pesticides, marketing some 850 million liters in 2013, i.e., 4.2 liters per inhabitant,⁷ with a direct impact on water resource pollution. Meanwhile, in the past five years, Brazil has undergone an unprecedented water crisis, affecting the urban population of large cities such as São Paulo and, above all, rural areas in Brazil's semi-arid region. In 2012, the State of Minas Gerais declared emergencies in 123 municipalities due to drought, a situation that basically repeated itself in 2014 and 2016.⁸

⁴ More than 220 species have medicinal uses and another 416 can be used to recover degraded soils, as windbreaks, protection against erosion or to create habitats for natural predators of pests. More than ten edible native fruit species, rich in vitamins, are consumed regularly by the local population and sold in larger cities, including: Pequi (*Caryocar brasiliense*), Buriti (*Mauritia flexuosa*), Mangaba (*Hancornia speciosa*), Cagaita (*Eugenia dysenterica*), Bacupari (*Salacia crassifolia*), Cajuzinho do cerrado (*Anacardium humile*), Araticum (*Annona crassifolia*) and Barú seeds (*Dipteryx alata*) (MMA, 2018).

⁵ BRASIL/MCTI. **Estimativas anuais de emissões de gases de efeito estufa no Brasil – 3ª edição**. Brasília: MCTI, 2016. Available at http://sirene.mcti.gov.br/documents/1686653/1706227/LIVRO_MCTIC_EstimativaDeGases_Publica%C3%A7%C3%A3o_210x297mm_FINAL_WEB.pdf/61e78a4d-5ebe-49cd-bd16-4ebca30ad6cd Accessed in May, 2018.

⁶ Recent studies reveal a correlation between rainfall variations and changes in land use caused by deforestation for farming. Analyses comparing seasonal data on the frequency of rain with spatial analyses of deforested areas document how more significant alterations took place in regions with more deforestation. Simulations using climate models from other studies confirm that deforestation has a direct impact on climate change in the biome.

⁷ CARNEIRO, F.F. et al (org). **Dossiê ABRASCO: um alerta sobre os impactos dos agrotóxicos na saúde**. Rio de Janeiro: FIOCRUZ, 2015. Available at <http://abrasco.org.br/dossieagrototoxicos/> Accessed in May 2018.

⁸ BRASIL/MINISTÉRIO DA INTEGRAÇÃO. **Sistema Integrado de Informações de Desastres**. Available at <https://s2id.mi.gov.br/paginas/series/>

Within the Cerrado, the Espinhaço Mountain Range (*Serra do Espinhaço*) plays a very important role for water supplies and for the conservation of native vegetation. It is also the Brazil's only mountain range and in the State of Minas Gerais is a great divide between the river basins of central-eastern Brazil and of the São Francisco River (COMIG and IGC / UFMG, 1997). In Minas Gerais, this mountain range forms a group of "highlands", laid out north-south like a boomerang, with the tips pointing east. According to Saadi's (1995), the name "*serra*" (mountain) hides a physiographic reality that is better defined by the term *planalto* (plateau/highland). The two wings of the boomerang correspond, therefore, to two highland compartments – the southern highland and the northern highland – differentiated in lithostructural and morphological terms and separated by an elongated depressed zone in the SE-NW direction. Its southern portion goes from the region known as Cipó (north of the capital of Minas Gerais) to the municipality of Olhos D'Água (north of Diamantina). It is noteworthy that the waters born in this part of the Serra are responsible for supplying major cities in Southeastern and Northeastern Brazil. Water from this area supplies the semi-arid region of Minas Gerais (the Jequitinhonha river valley and Northern Minas Gerais).



Figure 2: The Espinhaço Range in Minas Gerais, highlighting its southern section and the Diamantina highland (source: EMBRAPA, 2018)

According to Gontijo (2008), the Espinhaço "highlands" play a *sui generis* ecological role, and their latitudinal position and distance from the Atlantic coast deserve special

attention.⁹ Studies on the Espinhaço Range in Minas Gerais highlight both its *geodiversity* and its *biodiversity*,¹⁰ with more than six thousand species in the local biota. The presence of shrubby savanna *campos rupestres* (rupestrian grasslands) in the mountain range classified it as an area of special biological importance, due to the occurrence of endemic species and/or "unique environments in Minas Gerais, which qualify it as a priority area for conservation." The high degree of plant endemism includes the presence of 80% of the country's everlasting (*sempre-vivas*) flowers species (COSTA et al., 1998).

The presence of endemic species in the native flora, the abundance of high-quality water and the area's exclusive scenic beauty were factors that led to the recognition of this southern region of the Espinhaço Range as a UNESCO "Biosphere Reserve", in 2005. According to UNESCO the occurrence of different biomes with high biodiversity, the geomorphology of the range and the historical process as the importance of the colonial period (when Indigenous, Africans and European people were in contact) were also important aspects to the recognition¹¹. It also stands out as a home to the State's "mineiro" cultural heritage, especially its cuisine, which differentiates Minas Gerais from the rest of Brazil. The city of Diamantina was also recognized by UNESCO as a World Heritage Center in 1999¹², for its colonial architecture, and the title has helped promote tourism in the region.

Despite these recent acknowledgments, little or nothing has been done for the people who historically inhabit the region, whose communities have shaped its rural ecophysiology. In addition to its scant benefits from public policies, the region's average MHDI¹³ is 0.65, demonstrating the non-inclusion of these groups in the region's economy. The region has indeed long been occupied, and its settlement was differentiated within Minas Gerais, with emphasis on minerals, which drew the attention and brought investments in diamond mining by the Portuguese Crown in the 18th Century (MACHADO FILHO, 1980). In 1817, naturalist Auguste de Saint Hilaire visited the region and its diamond district, where he identified a

⁹ "The region's plant cover is represented by shrubby *campos rupestres* and highland fields, Cerrado and the main subcaducifolia forest. The occurrence of a particular type is strongly conditioned to climatic conditions and morphological features. [...] We see here a phyto-physiognomic and floristic mosaic [...] on the western and eastern slopes, which roughly define the elevation transitions from *campos rupestres* to Cerrado (São Francisco basin), from *campos rupestres* to Atlantic Forest (eastern basins) or from *campos rupestres* to the dry *caatinga* (lower latitudes). [...] In the limestone outcrops occurring in the transition bands with the Sanfranciscana Depression, on limestone rocks of the Bambuí Group, segments of *Mata Seca* (seasonal deciduous forest) are dominant." (GONTIJO, 2008, p.10-11).

¹⁰ The geologist Eschwege (1822) was attracted by the *serra* (GONTIJO, 2008), along with several European naturalists who also referred to it in the 19th Century, including Auguste de Saint-Hilaire, Karl Friedrich von Martius and Ludwig Riedel (COSTA, 2005).

¹¹ United Nations Educational, Scientific and Cultural Organization.

<http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=BRA+06>

¹² <http://portal.iphan.gov.br/pagina/detalhes/32>

¹³ Municipal Human Development Index.

large population of slaves from Africa laboring in the diamond mines. He also highlighted the flow of foodstuffs between the "*sertões*" (lowlands) and the "*serra*" (highlands), the flow of plants and animals from Europe and the local foods used by indigenous people (SAINT-HILAIRE, 2004). Recent research has found widespread cave paintings whose carbon-14 dating attests to the presence of humans in this area for over 10,000 years (ISNARDS, 2009).

Over time, there has been interaction between cultures and different *agri-cultures*, which shape what we see today in the southern Espinhaço Range in Minas Gerais. The agricultural system developed there is located in a Brazilian Savannah environment with a great diversity of soil and climate characteristics: from higher elevations (1,400 m) to steep slopes and deep valleys, intersected by water bodies at lower altitudes (600 m), where there are drainage areas near the river beds. There is a predominance of sandy, shallow and dystrophic soils at high altitudes and dystrophic sandy-clay soils at lower altitudes.

The climate in the high fields is Cwb (as per Köppen) with an average annual temperature of 18,7° C, and average annual rainfall of 1,500 mm. At lower elevations (600m), the climate is Cwa (Köppen), with an average annual temperature of 22.5° C and annual average rainfall of 1,170 mm. This is the semi-arid region of Minas Gerais. The complexities of *verticalities* and *horizontalities* in the system's landscape confer *elasticity/flexibility* to local agro-food strategies.

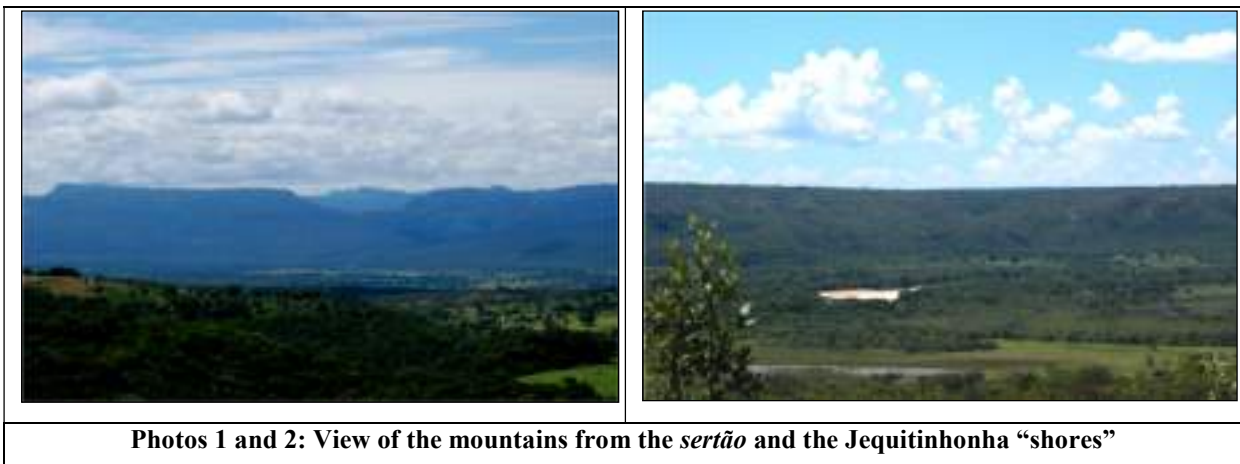
The Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais/BR

Residents in the communities of this portion of the Espinhaço Range share two common references: going "to the mountains" or "climbing to the fields"; while the escarpments of the mountains are references for the bottom or "foothills". The foothills below the mountain's western face, at around 600 meters elevation, are called the "*sertão*"¹⁴, with the Jequitaí River as a major locational reference. On the eastern face, with altitude also around 600 meters, the regional reference is the Jequitinhonha River - or the "Jequitinhonha

¹⁴ Ribeiro (2005) attributes the origin of the term *sertão*, based on etymological studies, to *desertão* (big desert, in Portuguese) possibly expressing a notion behind Europe's global expansion, seen as a center irradiating civilization to all the "*sertões*" to be conquered. The term was already in use in Portugal, at least since the 14th century, to refer to areas within its territory and distant from Lisbon. In Brazil, the idea of "*sertão*" as a desert can express the scant population, perhaps due to the way the region was appropriated during colonial times by large cattle ranches, derived from the granting of *sesmarias* (royal land grants). At the same time, as in other colonized areas of the world, "desert" is a way to denature all previous occupation of that territory by other societies, justifying civilized penetration into this human "void," void except for "barbarians" to be civilized. In the Brazilian imaginary there are still traces of such connotations, which feed discourse on the *sertão* as something "backwards," to be modernized.

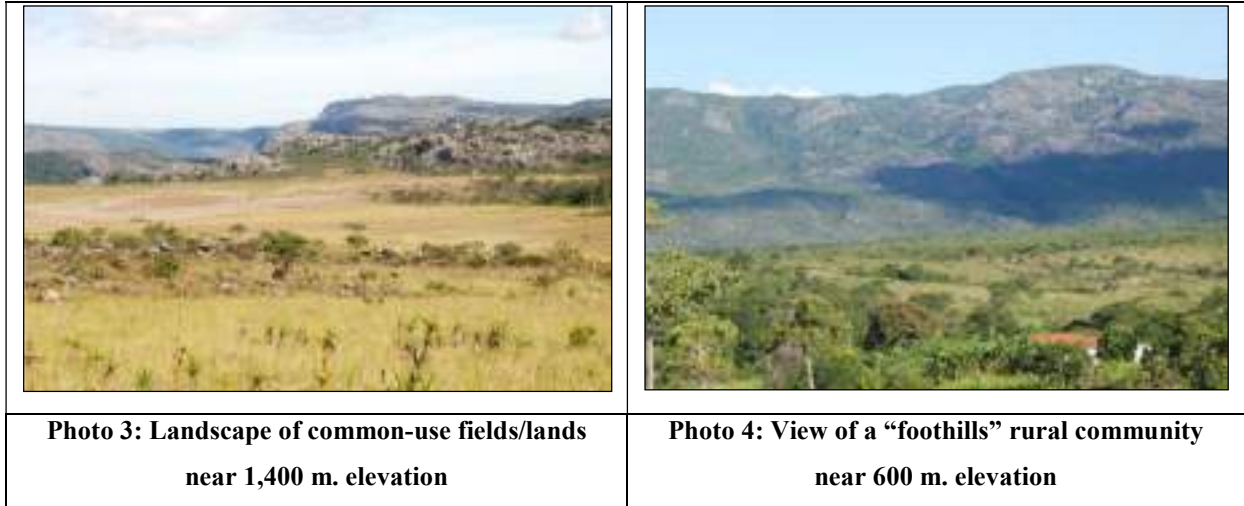
shores." "There it's not *sertão*", explain the residents.¹⁵ This side of the Serra is more humid, given the orographic rainfall of winds rising from the Atlantic coast. However, both sides of the mountain range in these lowlands are semi-arid zones, and are currently experiencing longer droughts and changes in rainfall patterns, due to climate change.

Up the hills, broad areas with flattened relief are known by the inhabitants as the fields, or also "*chapadas*", known in the region for the abundance of native *sempre-vivas* (everlasting) flowers¹⁶ typical of the shrubby savanna rupestrian grasslands. For residents who live in the mountains: "Everything here is mountains ("*serra*"), but every place has its own name, every inch of that mountain has a name of its own." Every field, valley and crest have names related to their histories, such as the João Alves field (names for a former resident); the jaguar thicket (a thicket of trees, in the middle of the fields, where there are springs and the cat comes to drink); the Branch Mountain (quartzite crest); the São Domingos stream (name of one of the biggest fields in Macacos, given in honor of a local patron saint). Another place with large fields is known as "*Chapada do Couto*", in *Mata dos Crioulos*, near the Itambé Peak, a major landmark for local inhabitants as the highest place in the region, with 2,062 m (SAADI, 1995). The use of toponyms is more than a way to name natural accidents; they are how local communities symbolically appropriate them, to celebrate and reify their own ancestral links to these places.



¹⁵ The statements/expressions of local residents are italicized or placed in quotes, or even in longer texts, to illustrate their standpoints and expressions.

¹⁶ Plants whose most commercially valuable species belong to the *Comanthera* gender. They are a major source of income for families in local communities.



Rural communities are thus present in all these areas, in the “*sertão*”, on the mountain range and along the Jequitinhonha River. Those whose homes are grouped in the mountains also use the lower and higher elevations within a smaller range, reproducing the same logic of the system’s *verticalities* and *horizontalities*, with the same agro-food strategies. There are also families that descend to the “*sertão*” and farm with relatives during the rainy season (November to March), as we will see later. These are the six localities/communities of flowers gatherers – three of them *quilombolas*¹⁷. The six communities seeking recognition by FAO as a Globally Important Agricultural Heritage System are: Lavra, Pé-de-Serra, Macacos, Raíz, Mata dos Crioulos and Vargem do Inhaí.

¹⁷ These are three communities descended from fugitive African slave settlements known as *quilombos* (equivalent to maroons or cimarrons), whose residents are known as *quilombolas*. They have been officially certified by the federal Palmares Cultural Foundation. In Brazil, *quilombolas* have rights to their ancestral territories and have been benefited by specific public policies.

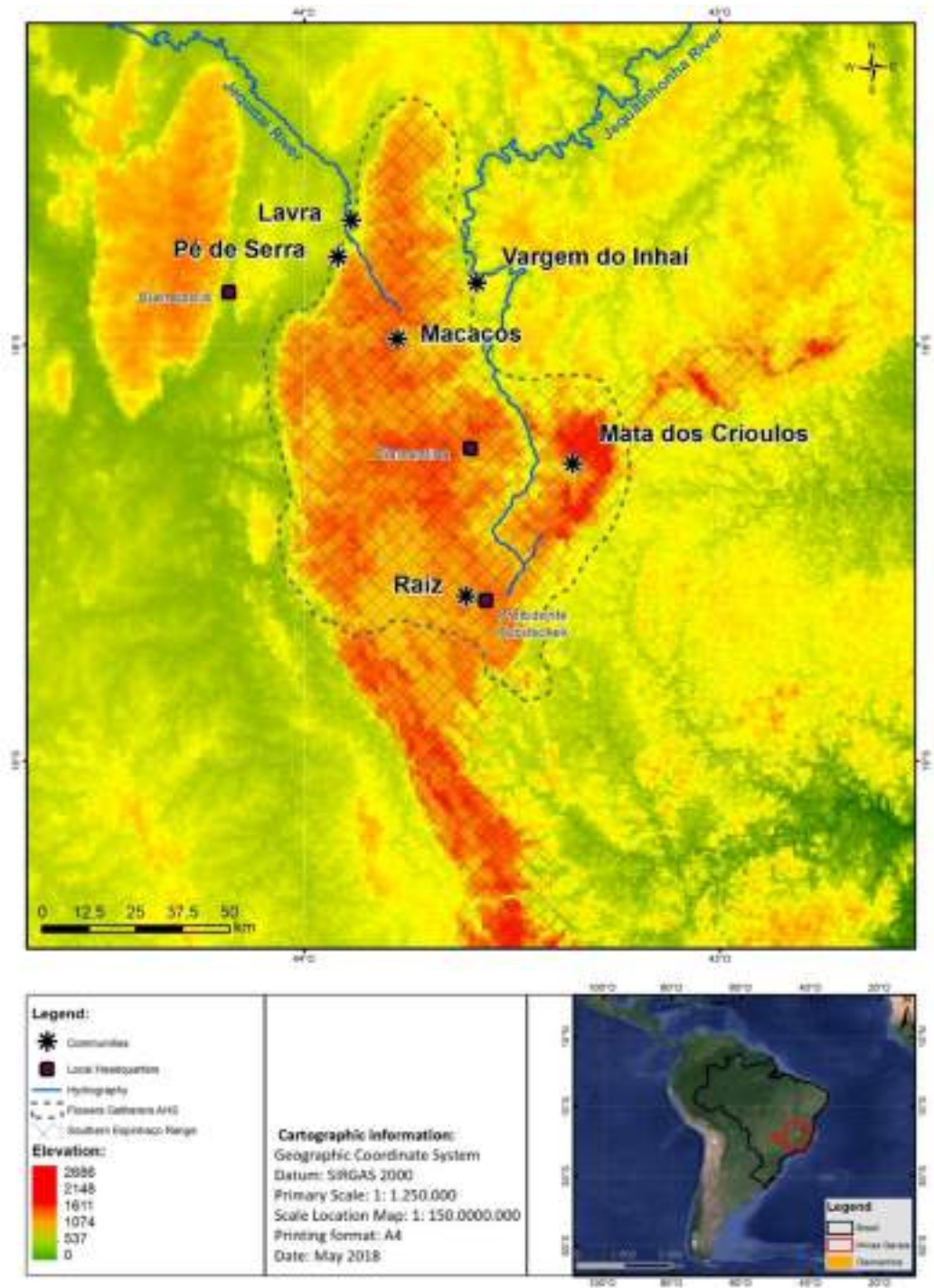


Figure 3 – Localization of the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (Brasil).

Contrary to some first impressions, the *crossings*, usually on horseback, and other uses of the range have similarities and continuity. The crossings of travelers and “troopers” (*tropeiros*), from the “*sertão*” with livestock and food up to the diamond mining areas, have been described since the early 19th century (Saint-Hilaire). The use of “freighters” (pack animals) is still common practice in the mountains, to transport people and flowers, for

example. The traffic of people and livestock back and forth between the mountains and the “*sertão*” occurs seasonally, following traditional practices and long-standing habits. Residents explain that the sale, and consequently the transport of livestock, from the “*sertão*” to the Jequitinhonha valley were frequent until recently: "depending on the price, it is worth taking". The crossings are to participate in traditional festivities in different communities throughout the year, as well as to return visits, forming bonds and ties of sociability. Ties of kinship and affinity among community members and their communities are frequent. Residents easily enumerate their relatives and friends on "other side of the mountain" or up the hills.

Most of the families build their houses in clusters in the lowlands, around the harvest fields. Depending on their vantage point, they talk about “climbing the mountain” or “going to the fields,” as a practice most common during the dry season (April to September) to “gather” or harvest the flowers and manage the cattle in the native pastureland. They can stay for weeks, thus characterizing it as *transhumance*. The flowers gathering, when families from different communities meet in the native fields, is an occasion for gatherings, parties and bonding. As one local woman put it: “A lot of people got married gathering flowers in the mountains.” This is indeed a moment and space for socializing among residents and their communities.

While they are in the mountains, families may live in “*rancho*”s, generally built with local raw material easily found in the native fields, like wood and palm leaves. They can also stay in “*lapas*” (grottos in the rocky formations), inside which they organize a kitchen and rooms, using mattresses made with native mountain grass. Some “*lapas*” are even named for the families who have traditionally stayed in them during the flowers-gathering, an activity that can involve entire families. During that period, they eat some food they have taken with them, along with some native food. It is also common to find old fruit trees around the “*lapas*” and “*ranchos*”, in the homegardens (*quintais*). The *transhumance* and the *crossings* both generate flows of plant and animal genes, of food and of economic activity between different communities, as well as creating and re-creating social relations over time and space, which are vital for the social reproduction of these groups and of their traditional way of life.



Photographs 5 and 6: Lowland homes and highland “lapas”

The communities are very receptive to outsiders "in transit," perhaps because they are so used to people coming through on long “crossings”, who "house" (“*arranchar*”) along the way. As one resident of the mountains put it: "People always pass by here and house at our place, many of whom I'd never seen before. I think it's good, because besides meeting people from another place, someday I too may need to be taken in. It's always good to help people." Their hospitality and solidarity, in times of difficulty, are constant. Another significant aspect is the recognition among residents of those who know the trails through the mountains in detail, seen as valuable knowledge. Different communities refer to them as people who "really know and can walk through the entire range." Folk healers, both men and women, also have a place in many communities.

Historically, these communities' *territorialities* (HEIDRICH, 2009) thus connect the region's various environments – “*serra*”, “*sertão*” and the Jequitinhonha River valley – where their life strategies have developed, using complex knowledge, permeated by meanings and understandings contextualized by the places they occupy, their *geographic knowledge* (CLAVAL, 2009), passed down and reinvented over many generations. They organize their work as families, for subsistence and for income from selling what they produce. The codes they share for the appropriation and use of land and related resources rely largely on kinship relations. They also have representations and social practices for interacting with nature, which for them is the creator of life and a whole, of which they themselves are part. The abundance of water is highlighted by the residents as a treasure they have inherited.

The families' agro-food and economic strategies are mostly rooted in: traditional agriculture and small animal husbandry (with a priority for family consumption); agroextractivism (with emphasis on medicinal plants and native savannah fruits with high vitamin content); the husbandry of rustic cattle and of pack animals (which graze on native

pastures, an important economic); the gathering of *sempre-vivas* (everlasting dry flowers), which confers cultural identity, besides being a fundamental component of the families' annual monetary income. The agroecosystem cycle occurs in lowlands/highlands management by guiding an annual agricultural calendar as shown below.

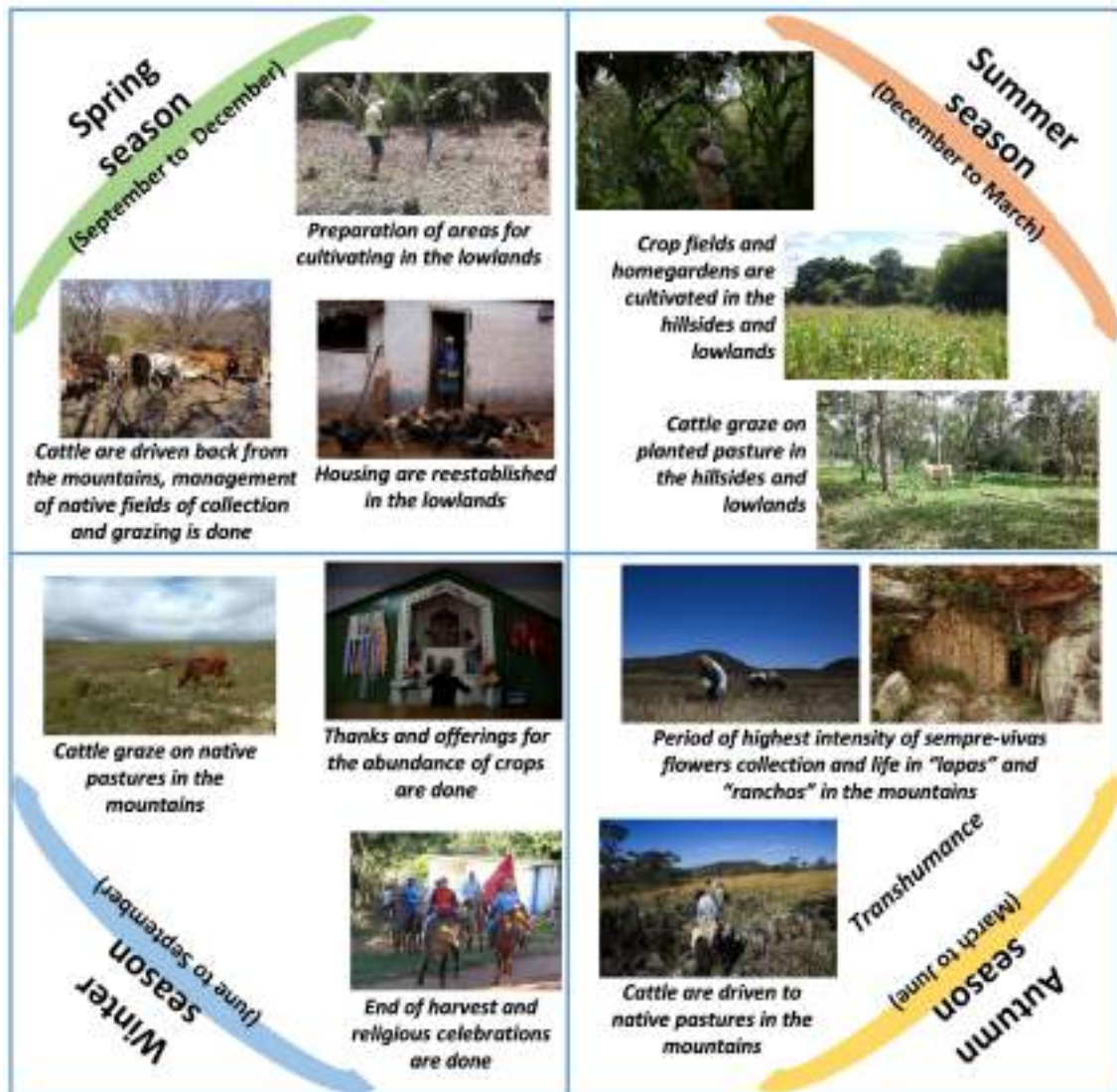


Figure 4 – Representative cycle of the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (Brasil).

The seasons for agro-food production are basically the rainy and the dry seasons:

- Rainy season – from November to March, when work is concentrated on cultivating homegardens and crops and on raising livestock in cultivated pastures near the homes.
- Dry season – from April to October, when work is concentrated in the higher elevations on common-use lands, to raise cattle and gather ornamental plants.

* Homegarden production, including smaller animals and agroextractivism (gathering edible native fruits, medicinal plants, oils, etc.) takes place throughout the year, depending on each family's needs and the plants and animals they possess.

1) Traditional Agriculture

The farming is done in *quintais* (homegardens) and *roças* (cultivated areas/crop fields). The homegardens use *agroforestry* near the homes, with a great diversity of vegetables (several of them native), medicinal herb crops, fruit orchards and small crops such as cassava, beans, squash, peanuts, sugar cane, potatoes, yams (*Dioscorea* spp), coffee and others. These small crops are justified in the homegardens, according to residents, who need food crops close to home for daily consumption. Animal manure is often used to fertilize these areas. Small animals are also raised in the homegardens, such as chickens and local breeds of pigs, as well as a few cows for the family's milk, in addition to bee hives (native and Africanized) and rabbits. Near the homes we also see the structures to process cassava, sugar cane and maize and to store seeds, foodstuffs, work tools, animal carts, etc.

The *roças* (crop fields), meanwhile, are to grow crops in larger fields located near the homes in the lowlands or at different elevations up the hills or even in the mountains. At lower levels, families use drainage areas near the river beds. In the mountains, with mostly acidic and dystrophic sandy soils, families look for plots with more clayey and reddish soils, as well as darker and wetter soils, which are indicators of "crop land" or greater natural fertility of the soil. Indicator plants are also used to locate these soils. It is common for the same family to have more than one, or up to five crop fields, all farmed at the same time, at different altitudes and depending on the environments, using crop rotation including fallow seasons and naturally recovering soil fertility with biomass, using slash-and-burn ("*roça de toco*") practices, as we will detail later in this document.

Crops are planted during the rainy season, usually between October and March, involving several local varieties of species including cassava, beans, maize, rice, fava beans, sorghum, sugarcane, pumpkins, potatoes, sweet potatoes, cackrey (*Cucumis anguria*), peanuts, yams and other crops, as well as fruit from taller trees. It is noteworthy that, based on kinship and godparenting ties, there are families who live and farm fields in the higher elevations and who, during the rainy season, descend to the "*sertão*" or the Jequitinhonha river "shores", to cultivate with relatives and/or "co-parents" (godparents of their children), or else to work a "piece of land of their own". The system requires this *elasticity* for agriculture

to be successful under such conditions and to ensure the food security of residents and communities.

So, we have both “homegarden-fields” and crop fields that “wander” through the mountains, following crop-rotation and fallow cycles and movements, which vary in time and space, depending the vast accumulated traditional knowledge and the needs of these groups. Family labor and craft techniques are always present, and women play a leading role in agriculture. Tractors do come into field preparation, but only in certain locations, and they do not play a significant role overall. In general, chemical fertilizers and agricultural pesticides are considered unnecessary and harmful. The priority destination of both homegarden and crop field harvests is for family consumption, and the surplus is sold.

In general, two strategies for the control of insects / pests and phytopathogens that occur in the crops and gardens are used by families: the first, and most common, is the diversification of the crops constituted by several species (being in the vegetable gardens, backyards or crops) including native flora species, in different arrangements such as consortia, rotations, polycultures and agroforestry systems. In these diverse arrangements occur insects and phytopathogens that can harm crops, but also occur natural enemies that exert biological control over the insect population and harmful microorganisms.

The second strategy is the use of natural pesticides, such as herbal extracts and biofertilizers, prepared from herbs and other products of the production system itself and from materials purchased on the market, mainly based on sulfur, calcium and copper. In the case of parasites, worms or other diseases that attack the livestock, they use herbal extracts and the herbs themselves for control, usually added to the food. Some examples of these composts:

- “Cravo de Defunto” Syrup (*Tagetes erecta* L.) for pest control such as mealybugs and aphids: an entire plant with leaves, branches and flowers is crushed with water in a blender, strained and diluted by 5 liters. The syrup is sprinkled on the plants to which the pests are attacking.
- “Lírio” (*Lilium* sp) for the control of worms in cattle: Whole plants, after drying, are ground in the disintegrator, mixed with salt or some fodder and served to animals.

Of the species cultivated in homegardens and crop fields, 94 are for food and 17 of them are medicinal and spice species, as local records now stand. Fifteen native food species are also used, two of which are endemic, and one is being considered for domestication, with initial research underway, which will be detailed later in this document. There are also

endemic species used in the local diet (monk's crown [*Melocactus zehntneri* (Britton & Rose) Luetzelburg] and "cave okra" cactus [*Cipocereus minensis* (Werderm.) F. Ritter]) and native species brought to the homegarden (gondó [*Erechtites cf. valerianifolius* (Link ex Spreng.) DC.]), which indicates its domestication and have gained special attention in research and the part used for food refers to the leaves that contain high iron content. There is a vast repertoire of recipes from the rich local cuisine, like *farofa*, a typical dish at festivals (especial religious festivities and weddings) in these communities (along with other dishes). Cassava prevails in local diets, as confirmed in the crop fields, where 26 cassava varieties have been identified in the fields of a single family. This high inter- and intraspecies diversity ensures harvests under local conditions and thereby the families' and communities' socio-ecological resilience and food security.

Agro-extractivism

There is agro-extractivism throughout the region, focused on native products: medicinal plants, fruits, fibers, oils and wood (used to build local houses and facilities). Fruits of the Cerrado are found and harvested freely – "they have no owner, anyone can pick 'em" – in an activity seen as a moment of play and commonly done in the company of children. The ability to locate this infinity of plants reflects the associated traditional knowledge present in all the communities present in the system. They use at least 35 species of native edible fruits, 16 species for lumber used in family constructions and 83 species of medicinal plants, cataloged so far.

This high diversity of species and associated traditional knowledge are the basis of knowledge and practices that permeate cultural practices in various dimensions: food, traditional medicine, architecture, rites and festivals. There is great vitality in the intergenerational sharing of knowledge, which allows the use of local agro-extractivism (known there as "*recursagem*"), and has long been fundamental for human survival in this region, under adverse environmental conditions, with little access to public services and policies.

Breeding Rustic Animals

The mountains abound in native grasses used to graze cattle. The "*curraleiro*" cattle¹⁸ are present, although other breeds have steadily been incorporated. The *curraleiro*

¹⁸ A breed still found in a few Cerrado environments in Minas Gerais (RIBEIRO, 2005).

breed is very rustic and was the first to arrive in Brazil, along with the colonizers. It was recognized in 2012 as a "Brazilian breed" by the Ministry of Agriculture, since it been part of the country's historical and cultural landscape for more than 500 years in Brazil's "*sertão*" and Cerrado. It is extremely adaptable, produces both milk and quality beef and is uniquely resistant to some toxic plants of the Cerrado, unlike other breeds, which reaffirms its rusticity and adaptability.¹⁹

Commonly, cattle are driven to the native fields during the dry season (April/May to October/November), when pastures in the lowlands (600 m) are dry or insufficient for livestock and the native pastures in the mountains stay wet longer. In native fields, cattle graze freely, searching for the most palatable native grasses, which occur in environments different from those preferred by native flowers. Flowers and other ornamentals are among the many plants not consumed by the animals, so there is no competition.

The families generally drive their cattle back from the mountains early in the rainy season (October/November to March/April), to near their homes in their communities, so they won't be "herbed" with toxic herbs that appear late in the year. Since no fences are used in the mountains, each family's cattle mixes with those from other families, but none of them see this as a problem. They say it is not hard to separate them at the end of each dry season, because every family knows their own herd. Cattle raising – in economic terms – is actually a family "savings account" which they can cash in when needed, but they are also for slaughter on festive occasions (saints' days and weddings), as well as being a very useful territorial management strategy.

The rainy season brings the cattle back down to the planted pastures just when the last flowers of the season are being gathered. The importance of this convergence of activities in the native fields is explained by one of the members of a local community: "We come down from the mountains with flowers, fattened cattle, pregnant heifers and cheese." This combination of complementary activities is part of the families' strategies for their own sociocultural and economic reproduction. Depending on the rainfall, they may need to supplement the grazing with cut grass and sugar cane, until the planted pastures are fully recovered.

¹⁹ Ministry of Agriculture and Livestock (2018).

Sempre-vivas flowers gathering

The dry season (April to October) is when families do the main sempre-vivas flowers harvest, while the cattle is in the native pastures in the mountains, although some species are gathered earlier. Sempre-vivas are non-timber forest products of the Espinhaço Range's endemic native flora, which grow in the shrubby rupestrian grasslands of the Cerrado (Brazilian savannahs). They are inflorescences that, after being gathered and dried, still maintain their original form and colors. The species with the greatest commercial value, from the *Comanthera* gender, are an important source of income for families, as well as a key sociocultural reference. Flowers gathering are often the first income earned by young people, who begin learning how to gather early, with their parents.

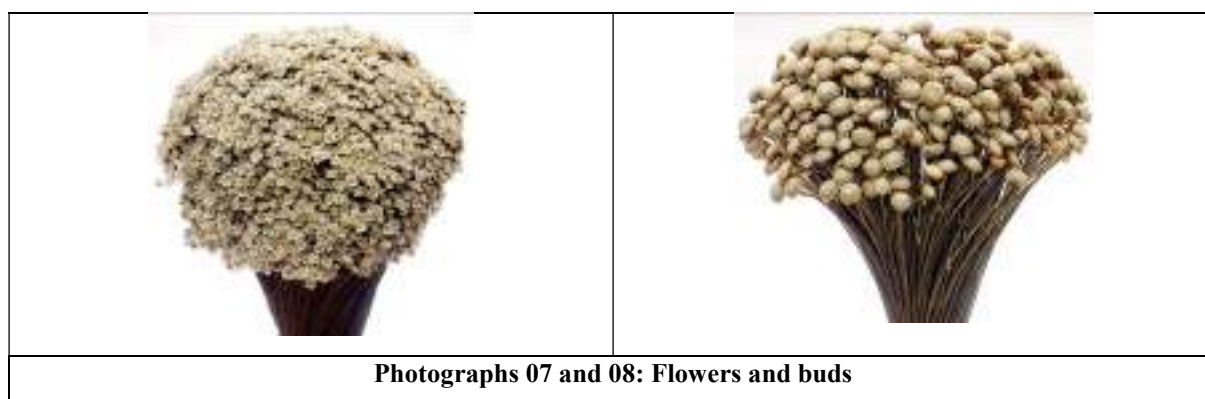
Communities often use the term “flower” to refer to the white inflorescences shaped like “little daisies”, while those with other forms and colors are called “buds.”²⁰ Merchants call them “dry flowers,” and distinguish between “flowers” and the group of “buds.” Consumers, however, call them all “sempre-vivas”, the name most popular in regional and national commerce. Internationally, in the ornamentals market, the term “dried flowers” is most common. Indeed, they are mostly exported to the US, Europe, Asia and Japan (MONTEIRO 2011).



Mosaic of photographs – Products gathered in the fields and prepared for marketing

²⁰ To summarize, the “little daisies” (*margaridinhas*) most gathered throughout the year, in chronological order by month, are: between January and February, *C. ruprechtiana* (morphotype janeirona) and *C. bisulcata* (morphotype carrasqueira); between February and March, *C. nitida* (morphotype sapatinha); from April to mid-June, *C. elegans*, *C. elegantula*, *C. bisulcatus* (morphotype). The most gathered “buds” are: January white or capoeira (*P. macrocephalus*) and November white or embroidered capoeira (*P. rhizomatosus*); the yellow jazida (*Comanthera vernonioides* var. *vernonioides*); the sedinha or golden grass (*S. nitens*); the nose piercer (*Rhynchospora globosa*); the big onion (*Cephalostemum riedelianus*); the little yellow (*L. flavescens*); the worldwide (*X. pilgrim*); the head of nego (*X. platystachya*) (OLIVEIRA, *et al.*, 2018).

For the *sempre-vivas* flowers gatherers (*apanhadores de flores sempre-vivas*) as they call themselves, each kind of flower and bud has a name to identify its features, revealing regional expressions and relationships, such as “*nose piercer*”, “*carrasqueira*”, “*brejeira*,” etc., and the names may vary from one community to another. In addition to flowers, they gather leaves, dry fruit, seeds, etc., which they can “merchandise,” from several different places and environments (fields, mountains, hills, hollows, etc.), depending on the season of the year and market demand.



There are several aspects to traditional management of the *sempre-vivas* flowers. First of all, 30% of the individuals are left in the fields to save seeds and maintain the plant population, i.e., the “*stubble*” left from the harvest. Seeds that fall on the floors of people’s houses (including the “*ranchos*” and “*lapas*” – highland homes), as the flowers are arranged for transportation and sale (when they are “*coiffured*”, as they say), are taken back to the native fields, to enrich and maintain the population of *sempre-vivas* (OLIVEIRA, *et. al.* 2012). Flowers can also be seen growing along the trails used by the gatherers in the native fields, meaning they sow the flowers throughout the landscape they manage.

For flowers gatherers, going to the fields involves feelings that go beyond an economic activity. The communities identify the mountains with their ancestry, affections, pleasures, freedom, work, income and tradition. Residents stress that “the mountains always gave us our living,” and also that “our place here brings little money, but it’s a wonderful place to live.” And they say: “Income is important, especially when you don’t have much.” Other sayings they repeat are that “the mountains cure depression,” and are the place where “you work hard and have a good time,” “a place to meet friends.” When it comes to harvests, we heard that “in the fields, your body gets tired, but the head is fine. We know when the flowers will open, so there’s nothing like going up [to the fields] and finding them open”;

“it’s so great, it’s a whole life.” The mountains also bring feelings, like “autonomy, where I can be myself and work in peace.” They also recognize that “it was pretty hard, far away, and difficult to walk that much.”

It is thus a self-determined identity expressing territorial ties that refers to the people’s culture, their sense of belonging and the sociocultural practices they have developed out in the Cerrado’s rupestrian grasslands. Their practices express a *way of life* governed by the cycles of nature, involving a wide range of complex knowledge capable of embracing a great diversity of environments, with 240 species of flora for ornamentation alone (see Annexe 02). Their knowledge has been handed down and shared over many generations and has ensured their families’ livelihoods through time, in adverse situations. The uses they make of those environments has evolved and changed over centuries of history, use and interaction with them as managed landscapes in constant co-evolution. One core element of that management has been the controlled use of fire in the Cerrado. The following photographs portray some of the communities’ day-to-day activities.



Photo 09: Agro-forest homegarden



Photo 10: Polycrop homegarden: yams (*Dioscorea* spp) and sugar cane



Photo 11: Agro-forest homegarden



Photo 12: Polycrop homegarden: watermelon and







	maize
 <p data-bbox="268 712 708 745">Photo 13: Local breed of “caipira” pig</p>	 <p data-bbox="906 712 1315 745">Photo 14: Manual sugar-cane press</p>
 <p data-bbox="220 1182 756 1216">Photo 15: Seed selection of a local bean variety</p>	 <p data-bbox="863 1182 1355 1261">Photo 16: Cassava crop in consortium with watermelon in the field</p>
 <p data-bbox="201 1702 775 1780">Photo 17: Maize crop in consortium with beans in the crop field</p>	 <p data-bbox="831 1702 1390 1780">Photo 18: Harvest of landrace/local maize in the crop field</p>



Photo 19: Harvest of edible native fruit



Photo 20: Crafts with native flora



Photo 21: Manual milking of a “*curraleiro*” cow, recognized as a Brazilian breed



Photo 22: Cattle herding in a native pasture



Photo 23: Flowers gathering



Photo 24: Transporting gathered flowers



Photo 25: Flowers drying



Photo 26: Waterway in the mountains

The communities work their fields as *common-use* lands, with frequent reference to *kinship* and *affinity* to ensure this objective. The uses are organized by specific codes that have evolved and been modified over centuries of history, use and interaction with these environments, meaning that they are “traditionally occupied lands” (ALMEIDA, 2006). There have been many private interests trying to encroach, especially mining companies, large-scale corporate agriculture and livestock investors, biodiversity-related firms (who seek access to genetic resources and related traditional knowledge) and even projects to set up integral conservation units on ancestral, common-use lands. This has taken place illegally, raising tensions and challenges for the communities.

The use, management and conservation of natural resources in this part of the Southern Espinhaço Range are rooted in a traditional way of life, with a differentiated agrarian structure recognized by Brazil’s legal system, in its 1988 Federal Constitution²¹ from which follows Federal Decree 6.040, which guarantees the recognition of traditional lands in common use as traditional territories to be destined for “Traditional Peoples and Communities”²², including *sempre-vivas* flowers gatherers²³.

The mechanism that enables and operationalizes this in the state of Minas Gerais, where the *sempre-vivas* flower communities of this traditional system are located, is in State

²¹ Article 216 of Brazil’s Constitution defines the country’s cultural heritage as the material and immaterial assets which bear reference to the identity, action and memory of the various groups that form Brazilian society, including, *inter alia*: (a) forms of expression; (b) ways of creating, making and living; and (c) works, objects, documents, buildings and other spaces intended for artistic and cultural expressions.

²² Decree 6040/2007, Article 3 defines traditional peoples and communities as: “culturally differentiated groups that recognize themselves as such, have their own forms of social organization, occupy and use territories and natural resources as a condition for their cultural, social, religious, ancestral and economic reproduction, using knowledge, innovations and practices that have been generated and transmitted by tradition.”

²³ According to Federal Decree 8.750 / 2016 which established the National Council of Traditional Peoples and Communities, where this group participates and maintains a permanent dialogue with the federal government.

Law 21,147²⁴, which guarantees the collective titling of common property lands as a way of guaranteeing their protection. This requires recognition through the issuance of a self-definition certificate, and the 06 communities involved here have already been recognized and the land regularization processes are open, as provided for in the Dynamic Conservation Plan.

Considerations on the system's global importance and challenges

This is a complex traditional agricultural system, in which the use of *lowlands* and *highlands*, *horizontalities* and *verticalities* fosters diversity and great wealth. Transhumance here is a necessity as well as a cultural practice that enables the utilization of these environments' entire ecosystemic potential, to sustain life in the midst of adversity. The knowledge handed down through generations is also vital to ensure the traditional management of all the species and natural cycles involved. With all their agricultural, food and medicinal practices, a single community manages 480 species of plants (cataloged to date), in addition to an intra-species diversity that ensures production in the edaphoclimatic conditions described above.

The combined uses of these different *agro-environments* (RIBEIRO, 2010), with associated traditional knowledge, thus allow a variety of uses to take place and to have sustained families over time, along with the cultural reproduction of their social groups. It is also clear that greater or lesser priorities given to different activities may vary, depending on the need to increase family income, on market prices, conditions for carrying out the work or even their shifting preferences. The plurality of activities ensures greater *flexibility* in the face of a families' domestic and external contexts.

The central elements standing out in the heritage agricultural system developed by these flowers gathering communities are therefore: their vast knowledge about the ecosystemic potential of different agro-environments in the Espinhaço Range and its environs; their vast know-how in native flora management, how to conserve and ensure its long-term use over space and time; their profound understanding of natural cycles, to enable food production and conservation of needed natural resources, especially water (of vital importance due to the climatic adversity of semiarid areas in lowland landscapes near the mountains); their capacity to precisely locate patches of soil most suited to cultivation amidst a mosaic of environments; the high diversity of local genetic resources used for agriculture

²⁴ State Law 21.147/2014 enacted the State policy for the sustainable development of the traditional peoples and communities of Minas Gerais and the protection of their territories. This law establishes also the State Commission (Decree 47.289 / 2017) responsible for observing the land regularization of the traditional territories of these groups and developing appropriate public policies.

and food, co-adapted to different agro-environments (with varying levels of moisture and low natural fertility); their mastery of techniques that enable the recovery/increase of the fertility of naturally acid and dystrophic soils (including agroforestry, polycrops and crop rotation with fallow cycles); ensuring the inter-generational sharing of knowledge and social values that sustain the system; and the development of production, political and economic strategies that ensure socio-ecological resilience, to enable the socio-cultural reproduction of these groups in the face of adverse conditions they face over time.

Today, the integrity of the territory has been well preserved. There are managed landscapes with much biodiversity and water, community systems to manage natural resources grounded in customary rights that define access, usage and use regulators to foster conservation of the natural resources required for life (soil, water and biodiversity); shared management of agro-biodiversity through selection, multiplying and circulation among families and communities, to enhance its conservation; agri-food strategies combining the diversity of activities (agriculture, livestock and extractivism) with adapted genetic diversity, to ensure a high level of food security and socio-ecological resilience. Economically, the strategic blend of activities is also a hedge against variations in prices and demand in markets for the various products. It is also significant that the priority of agriculture and small-animal husbandry is food security for the families and communities. Cattle is an important “savings account,” that is cashed in at times of monetary need and for festivals. The gathering of ornamental flowers ensures yearly monetary income for families and communities.

Thus, the agri-food strategies that enable the system’s continuity combine edaphic and biota diversity, co-adapted with knowledge and culture, to achieve food security, unique managed landscapes and the social reproduction of diversity. Their practices enhance natural processes and cycles (energy, nutrients, organic matter, biotic interactions); the conservation of renewable natural resources (soils, water, biodiversity); restraint and independence from non-renewable natural resources (fossil fuels, and others) and from industrial inputs; low consumption of external inputs and even the absence and rejection of harmful ingredients (pesticides, GMO crops, anabolic steroids).

Those features allow a differentiated occupation of edaphic spaces with diverse approaches to the use of soil, water, air and light, as well as interactions between fauna and flora (synergisms, complementarities, cooperation, etc.). Examples include the mixture of crop varieties, consortia, crop rotation, polycropping, agroforestry systems and the integration of crops, livestock and extractivism. The abundant diversity of fauna and flora leads to a wealth of agro-biodiversity, when associated with species introduced by local forms of

agriculture. The native flora and fauna are very well known, including their habits, habitats, areas of occurrence and their multiple uses and significance. They are part of the people's food, housing, clothing, tool-making, medicinal and religious practices and strategies, as well as sources of income and part of their own way of life.

The system fosters the conservation of a biome that is important to Brazil and the world, in terms of biodiversity, water resources and climate regulation; genetic resources adapted to adverse conditions and key to food production in extreme semiarid conditions and in the context of global climate change; conservation of rare endemic species and domestication of food species; and vast knowledge associated with an agricultural and bio-cultural legacy whose logic enables sustainable food production, considering environmental, socio-cultural, economic and political factors favorable to shared management of common goods essential to life.

We thus stress five major features underlying the global importance of the The Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR):

1. **Agriculture** in the Brazilian Savannah in synergy with nature promoting an ancient pattern of land occupation where traditional agriculture has indigenous traits, gathering and extensive grazing, with low environmental impacts. This is clear in the conservation of natural resources (water, fauna and flora) that led the region to be recognized as a Unesco Biosphere Reserve, and to the creation of (national and State) natural parks that coincide with these communities' common-use lands.
2. The system's **landscape** has a strong cultural identity. Its unique landscape management is the fruit of an intimate, intelligent, ancestral relationship with the environment that has led to the sustainable use of its natural resources. That use rests on a vast store of knowledge, family-based labor and cultural practices that go back generations. This complex system occupies a considerable land area whose sustainable use is rooted in a conservation logic developed to use all of its ecosystemic potential, with full respect for the renewal cycles of its natural resources.
3. The unique **way of life** has codes for appropriation and use of the land that have evolved into community resource management, with a common-use land regime, reciprocity and a cosmivision that give rise to their own way of doing, creating and living. This combines with the organization of their economic life and their socio-cultural reproduction in accord with the availability of resources and with the needs and natural cycles of its renewal, based on transhumance.

4. The significant **agroecological** interactions between agriculture-livestock-extrativism and the wealth of associated **traditional knowledge** sustains the system's agroecological functions. Their knowledge is profoundly aware of and combines edaphoclimatic features, natural cycles, fauna and flora to manage energy and nutrient flows that enable a sufficient quantity of quality food and generate ecosystemic services. This takes place: (a) in agroforestry homegardens, (b) in crop consortia with rotation and fallow cycles in different locations in the landscape where soils are most suitable, (c) in the cattle manure used in homegardens, (d) in food crops to supplement cattle feed, (e) in the management of cattle and flowers in the same space-time, with the right equilibrium to maintain both activities, (f) in managing biomass to generate nutrients for the system while protecting water resources, (g) in the use of native herbs as phytotherapeutics, (h) in the conservation of the native flora and (i) in their relative independence from external inputs and non-renewable natural resources.
5. The rich local **diversity** of fauna and flora means a copious agro-biodiversity adapted to adverse conditions. The groups make widespread use of both inter- and intraspecific genetic diversity, adapted to the mosaic of agro-environments that express the intense agro-biodiversity which, in association with crop, livestock and gathering techniques, ensures their **food security** while generating income and socio-ecological resilience. Conservation is very important, for rare endemic species of the native flora, for a pioneer Brazilian cattle breed, for several plant varieties whose center of diversity is in Brazil (cassava, peanuts, sweet potatoes, beans and yams) and for the ongoing domestication of food species. It means that this site is an important living seed bank with global significance.

In other words, the human groups living for centuries in this region have managed to produce enough food, in quantity and quality, despite many adverse conditions including colonization, when indigenous peoples and runaway slaves (*quilombolas*) had to remain invisible to the eyes of the colonizers, making their food autonomy a vital concern. This system is thus a fountainhead of waters, agro-biodiversity and traditional knowledge associated with this outstanding *agri-culture* in the unique landscape, that constitute an extraordinary *agricultural heritage* with a differentiated role to play in the Brazilian and global contexts, due to their present socio-ecological function and their historic and future importance in the heart of Brazil's Cerrado (Savannah region), which has undergone an intense process of devastation.

II. 2 Characteristics of the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR)

1. Food and Nutritional Security

The families' food and nutritional security is based on a number of products from their crop-livestock-extractivism activities, as well as fish for families living along the Jequitai and Jequitinhonha rivers. This implies an intrinsic relationship between land use and agro-food strategies to produce enough quality food, as well as their home economy. Key elements are the intra-household flows and their off-farm relationships, to enable agro-food production and to dynamize each family's and the community's economy.

The families' land-use patterns combine their own areas (located mostly near the communities, and defined as family units) with common-use areas (where flowers are gathered and larger animals are raised), to ensure their social reproduction or enable the production of life by participating groups. We have seen how the logic of the system developed by the *sempre-vivas* flowers gathering communities involves *horizontalities* and *verticalities* in the Southern Espinhaço Range (MG, Brazil), identifying patches of soil with more natural fertility to plant their crops, graze larger animals in open pastures (or with less intensity), and to manage the native flora, within the natural cycles, optimizing their energy and nutrient flows. In adverse conditions, this demands a considerable amount of land, a small part of which is occupied on the lower elevations for homegardens and crops, and most of which is in the highlands, used for gathering and grazing.

Most of the area in the system is covered by forest, rocky outcrops, scarps and steep hills, which must be conserved to maintain the abundance of water resources. In addition, the crop fields "wander" to find the most appropriate soils for the crops, at both medium and higher elevations. A family's crop fields may be from 300 m. to 6 km apart from each other, and they normally walk that distance. To get to the flowers "patches," for example, they may have to walk 10 km or more. This is why the territory a community occupies with their family plots and common-use lands covers an average of 15,000 ha. That total area is smaller for communities that live at higher elevations, closer to their native fields.

In a survey of communities in the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR), Costa Filho (2014) found that the family-controlled land areas used in the community include neither the common-use lands as a whole nor the areas with housing and crops in the highland fields used only during the season, when they

stay there to raise cattle and gather flowers. More than half of those family areas are smaller than 30 ha. It is also common in the region for each family unit to include the younger members and provide land for the new generation to work, and possibly for the formation of a new family. The common-use land is thus indispensable for a group's social reproduction, to being in young flowers gatherers and provide them with new crop fields, access to the flowers fields and thereby access to income, since the pattern for setting up new families in their respective homes is patrilocal, that is, new families normally live on the land of the groom's father. Significantly, the *sempre-vivas* flowers are the first source of monetary income for the community's young people.

Native flora is part of strategies for food, housing, tool making, medicinal and religious practices, as well as income generation, in the case of ornamental plants and flowers. Native and cultivated fruits play key roles in providing vitamins and minerals for the diets of families and small animals, which in turn are a source of protein in the family diet. The crop fields prioritize family consumption, but surpluses may be sold. Cattle also provides proteins, but is above all an economic "savings" strategy, to provide monetary income periodically, or when a family has special needs.

Beef is consumed at festivals, along with *farofa* and other special-occasion dishes. Cassava is used daily for flour, processed in the communities, as well as in different meals (such as the afternoon "lunch"). Families also include in their daily diets: maize (used for dishes such as *angú*), several types of beans, squash, sweet potatoes, fruits in season (native and cultivated), "greens" (native and cultivated vegetables), coffee and *rapadura* (candy from raw sugarcane to sweeten drinks and for journeys). Food culture is thus grounds for maintaining agrobiodiversity, as crop fields are planted that are adapted to the system and harvestable, along with things that are valued in the food diet.

The agro-food, cultural and economic strategies are thus interconnected, and the system generates both monetary and non-monetary income. Food can be consumed by the family, become monetary income or be bartered or donated between families, to ensure a communities' food and nutritional security. Family and godparent relations also come into play, in which ensuring food for a group is a community value.

Recent research (NAC/UFVJM, 2015) focused on family agroecosystems has identified nine subsystems: extractivism, garden (*horta*), chickens, diversified crop fields, homegarden (*quintal*), orchard, cassava, sugarcane, forest and cattle. These subsystems are distributed throughout the agroecosystem and are managed by families, within the conditions of local environments. The choice of places to plant or cultivate depends on soil moisture,

types of soil and the state of native vegetation. Production is diversified and goes mostly to feed the family and to sell some products.

The families have: livestock (cattle, horses, chickens); crop fields (cassava, sugarcane, maize, beans, rice, squash and others); various homegarden crops (greens, fruit, medicinal, etc.); and extractivism (gathering fruit, flowers, medicinal herbs, firewood, etc.). To illustrate the system’s diversity and the food and nutritional security connected to economic strategies, we present below a figure representing flows (figure 05) within the communities involved in the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR) which depicts relationships between the system’s subsystems and the outside world, with each other and with the family:

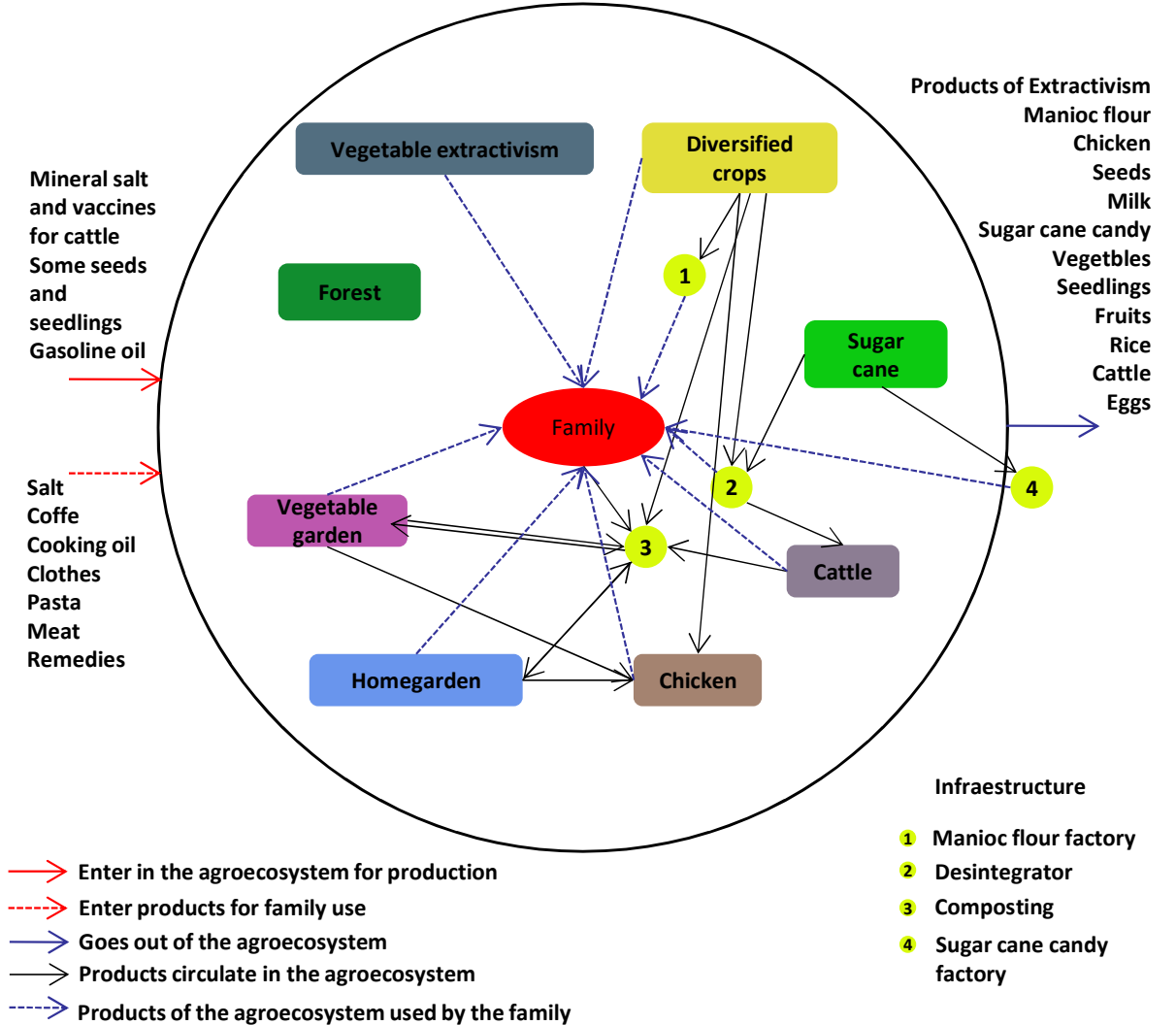


Figure 5 – Representative agroecosystem of the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (Brasil).

In general the family agroecosystem has several crop fields, some of them fallow and others, at the time of the survey, planted to beans, fava beans, maize, pineapples, squash, potatoes, watermelons and – along the Jequitinhonha River shores – there is still some unirrigated rice, which used to be widespread in the region. One of the fields is identified as “cassava,” a common generalization in the area, but which actually is a polycrop planted to beans, pineapples, cassava and several native species (*pindoba*, *pau d’óleo*, *monjolo*, *pequi*, *sucupira*, and others).

The families produce and gather most of their own food, which is diverse and changes through the year, as varied species come into season. All the vegetables they consume are from their own gardens. Fruit also makes for a very diverse diet, including both native and planted species. Normally, the family’s own harvests of beans, potatoes, maize, cassava and yams are enough for their own consumption. All of them, especially the last three, are prepared with a variety of recipes.

To round out their diets they also purchase salt, oil, rice, pasta and sometimes beef, coffee and some beans (in recent years when the dry season has lasted longer). When rain is plentiful, more rice is planted. Beans are only purchased outside when they do not harvest enough to feed themselves for the whole year, due to climate change. Their coffee harvest is often enough for most of the year, and the rest is bought in the market. Within communities, it is also common to see donations or bartering between families. Food is also donated to the community school, where their children study. Below, we have a graph on the monetary income earned with the sale of farm products (especially cassava flour and brown sugar/*rapadura*) and families’ expenses on food products throughout the year.

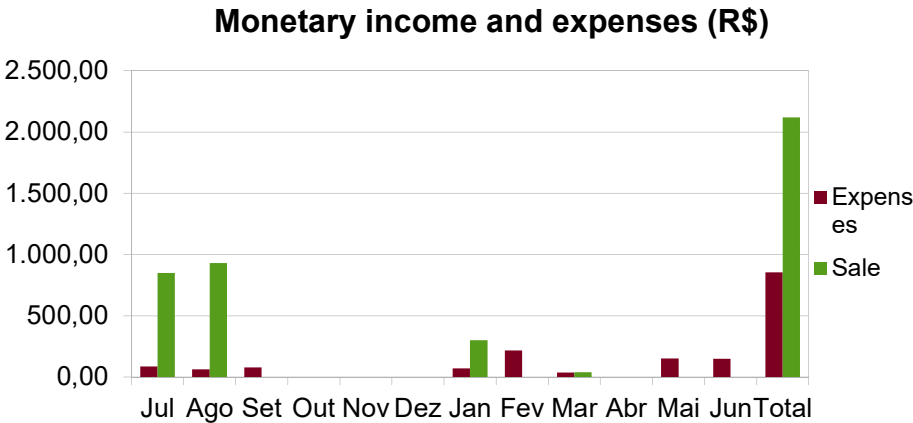


Figure 6 – Monetary income earned with the sale of farm products and families’ expenses on food products throughout the year (in BRL).

With regard to the economic benefits of the system, as shown in this graphic, food products derived from family crops turn into monetary income, which is higher than the cost related to the purchase of complementary food and even basic working utensils for the production. In relation to monetary income from the sale of flowers and other ornamental products, it is generally the largest annual income of families. One harvest can mean R\$ 12.000,00 (US\$ 3,000) per year for the same family (almost 12 Brazilian minimum salaries). The sale of cattle also occurs and participates in the family economy, being generally considered “savings”. This means that it goes on sale, usually when the family decides to invest in agricultural production, through an equipment purchases for example, or in times of need for money for some family urgency, such as health care outside the community or for major investments in the family’s agroecosystem (to buy equipment, tools, etc.) This may include equipment to prepare cultivated pastures.

The area planted to certain species can increase depending on demand from the market or for the family’s own consumption. They may also use other sources of income, such as hired labor for other local residents at certain times of the year. The family’s own division of labor includes the entire family (mother, father and children) in gathering activities and in housekeeping. Today some families have access to federal social programs, pensions and, at times, public credit lines for family farmers (NAC/UFVJM, 2015).

All the families in these communities possess homegardens, crop fields and livestock, and gather a range of products. Women do most of the work in homegardens and raising small animals, and do a fair amount of work in the crop fields as well. They thus play a key role in the family’s food and nutritional security. In quantitative terms, Costa Filho (2014) observed that over 80% of community members gather flowers, due to their importance for annual income. Moreover, 66.67% of the families’ farming production is for their own consumption, and 30.27% is for sale or barter. Only 26.11% of the families fish for any significant share of their diets, and fishing is not a substantial source of monetary income. Handicrafts are only a major income source in one of the communities surveyed (Raíz).

The fishing is done by hand using bamboo rod, cotton line and hook for family feeding in a timely manner between March and October. In the other months, fishing does not occur due to the fish reproduction phase, which is respected by the communities. Still, it means a source of protein to families, especially those residing nearby the larger rivers.

In the local logic, monetary income complements a family’s non-monetary income and comes from the sale of various products, mainly crops, livestock and agroextractivism/flowers gathering. Only 14.74% of community members earn money from

pension plans, 4.48% from wage labor and 11.57% from social welfare benefits such as BPC (minimum wage for the elderly and disabled), Family Stipend (aid for low-income families) and others.

Families often resort to mutual aid or cooperation with each other. 91.13% of respondents spoke of cooperation and solidarity among families. Forms of cooperation include support for the elderly and ill (26.55%), exchanging days of work (8.44%), service bartering (22.58), group work activities (10.92%) and about 3% mentioned other forms of cooperation and solidarity. This preponderance of solidarity grows from tradition, where wage labor is rare. What prevails is cooperation among families in their productive activities, for farming, extractivism or others.

Water is also a very dear and vital issue for families and communities, since their way of life is so intimately linked to their environment. In the survey, water was described as one of the region's greatest riches, a heritage long revered since the time of their ancestors: "Water is everything for us; it enables us to live. Here in the mountains we have plenty, but we have to be careful for it not to run out. Its' been this way since the old folks' times. There are areas that have been covered by thick forests for generations, just to preserve water."

The data also shows how free access to ancestral lands is closely related to human water supplies. Water for 43.26% of the households surveyed comes from nearby springs, and 38.14% from perennial rivers or creeks. Other less significant sources are intermittent rivers or creeks (4.19% of households), artesian wells (3.26%), cisterns (0,47%) and 1.40% from other unidentified sources. Nearly all households (96.06%) have indoor plumbing.

The Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR) thus enjoys a high degree of food and nutritional security and capacities for generating surpluses, with both monetary and non-monetary income. Women play a significant role, as do the reciprocities between families and the agrobiodiversity they have adapted with their associated traditional knowledge. Their shared management of the agrobiodiversity and the combination of various uses and activities associated with local agro-environments allow them to deal with market and price volatilities for a variety of products that are significant for their food security and their overall resilience.

2. Agrobiodiversity

In this context, agrobiodiversity means the variety of animals, plants and microorganisms used directly or indirectly for food and agriculture, including native and

cultivated species of plants, livestock, agroforestry and fishing. The Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR) enjoys ample biodiversity and genetic resources of global importance for food and agriculture, including species that are endemic and undergoing domestication.

In all the area's forest, mountain and native fields, we have identified the native flora species that are managed for food and non-food purposes (see Annex 02 – list of managed species), as follows: - 35 species of edible native fruits; - 83 species of medicinal plants; -16 widely-used lumber species, mostly for local construction; - 240 ornamental species for income generation, with flowers endemic to the Southern Espinhaço Range; - They also manage some fiber-producing species for roping (such as *piratro*) and others for vegetable oils (such as *pequi*).

Access to and use of the native flora, inside each community's area/land, is controlled by its members (kinship is the grounds for access to resources) according to the community's customary uses, which combine: where to look, when to gather, how to gather and how much to collect of each species, to ensure its conservation. Management is based on traditional associated knowledge covering the natural cycles of species and the intensity of gathering, to ensure the renovation/continuity of each species. These communities thus live with and co-adapt to this broad range of native flora species, for their food, health, tools, housing and monetary income.

Human groups therefore defend and increase the populations of the species of interest to their system. They take them beyond their geographic limits, in their long walks, they select and enrich native fields with seeds stored from the harvest and they remove individuals that affect populations of social interest. This means a direct, ongoing ecological interaction between human and plant populations, which will be detailed below, in item 5. The communities' approach preserves forests, hillsides and springs, engendering an extremely rich biodiversity of flora and fauna associated with their system, containing several of the Brazilian savannah's phytophysionomies, the reason of why the creation of natural conservation units and the area's recognition as the Espinhaço Biosphere Reserve, in recent years.

To date, 240 managed ornamental species have been identified, and those defined as flowers and buds correspond to 90 different species in both shape, color and habitat (see Annexe 02). The flowers and buds are managed in their habitat and the main conservation practices are: respect the ripening point for collection in which part of the seeds has already been expelled by the plant ensuring new individuals; during collection the families leave 30%

of individuals without collecting, being this residue also responsible for conservancy of the population of the species; the return to the native fields of the seeds that fall into the flower storage places known as "enrichment" of the native fields. These practices aim to maintain and expand the populations of species managed and marketed by families.

For forests, part of them is under management for the traditional cultivation system (slash-and-burn), usually in the lower reaches of the landscape, and other part (near the watercourses) is conserved for the conservation of water resources. In both cases, medicinal herbs, edible native fruits, oils and resins of tree species are collected for community use. There is also use of wood for domestic construction and its dry branches deposited on the ground is used for firewood at family's kitchens as fuel energy of domestic stoves in the preparation of food. In all cases, the collection of forest products, timber and non-timber, occurs according to the lunar calendar and vegetative cycle in order to conserve community forest resources.

Food sourced from homegardens, crops fields and pasture land can be grouped as raised and cultivated food species (see Annex 02 – list of cultivated species):

Animals

- small animals – poultry and local breeds of pigs;
- large animals – mules, horses and cattle, especially the *curraleiro* cattle, which are rustic, extremely adaptable, doubly suited to quality milk and beef production, with an unequalled resistance (lacking in other breeds) to some of the Cerrado's toxic plants, making them even more rustic and adaptable.
- others – bees (native and Africanized) and rabbits;

Plants

- 94 species cultivated for food, 17 of them as medicines and spices grown in homegardens, led by species whose global center of diversity is in Brazil (cassava, peanuts, sweet potatoes, beans and yams);
- 15 native food species, 2 of which are endemic (lapa okra and *coroa de frade*) and 1 of which is being domesticated (*gondó*). The *gondó* is native to Brazil and was incorporated into local homegardens years ago. Communities differentiate between "bitter" and "sweet" *gondó*, a difference ignored in the literature. Studies are underway to analyze its domestication.

The existence and maintenance of agrobiodiversity on the Southern Espinhaço Range are due to the actions of these human groups. Their domestic animals, even those from highly adapted native breeds, depend on the families' care to survive (complementary feed, vaccines). The species they cultivate in their homegardens and crop fields grow in soils enriched by anthropic activity, and depend on the ongoing selection of varieties, the circulation of germplasm and being used for food and cultural practices (medicine, spices, religious and other festivals, etc.). There is shared use and management of agrobiodiversity among families and between communities, which is vital to maintaining this broad gamut of species.

Specific aspects play leading roles in this process. Their food culture passed down through generations expresses the co-adaptation between human groups and the system's agricultural and food species. Their inter-generational knowledge associates farming practices with the conservation of germplasm and the use of species associated with the system's different agro-environments (in their *verticalities* and *horizontalities*). The species also circulate among the groups, for the region's entire genetic heritage to be ensured. Local conditions guide a selection process that enhances the adaptation of diverse varieties. There is a high degree of inter- and intra-specific diversity, especially in cassava.

Certain processes are also key to the conservation of this rich agrobiodiversity. Among the youth who stay in the communities, each new family settles as a "neolocal" family and takes seeds and seedlings to begin their homegarden (including animals) and their crop fields. This explains why their answer, when asked where the seeds come from, is normally "These are generation seeds." It means they have been handed down from one generation to the next and are suited to producing in local conditions. Fathers and sons often exchange seeds, and mothers may farm the crop fields together with their daughters, or even sisters, in some locations. Some families now buy vegetable seeds of species that do not reproduce in the region, due to the climate.

A principle shared by the communities also holds that anyone who has or acquires a new variety must "give" some to relatives and neighbors so as "not to lose the race," i.e., to ensure its conservation. When someone loses their seeds, they expect them to be present in several of the community's crop fields or homegardens, enabling prompt recovery. There are also exchanges between communities through marriages, kinship and affinity relations. The conservation of germplasm thus depends on constant planting and use and on circulation within and among families, and within and among communities. Of course, the seeds of local varieties and breeds mean autonomy for the groups' production and food supplies – an

important value in their cosmovision. They are also a sign of tradition, in the face of modern agriculture's technological "packages."

Another important dynamic for gene flows takes place during crossings and transhumance in the mountains. This sociocultural dynamic involves the exchange of material among the three major landscape domains ("*sertão*", mountains and shores of the Jequitinhonha) ever since the ancient travels of "troopers" and today during gatherings in the flowers-gathering and cattle-grazing season, as well as through marriages and festivals. This also relates to the presence of fruit trees around the "*lapas*" and small homegardens near the *ranchos* in the mountains – in the native fields.

Women play a vital role in the use, conservation and circulation of germplasm, and in passing on inter-generational knowledge on preserving their food culture. They have a direct connection to germplasm conservation, due to their strong influence over which material will or will not remain in the homegardens and crop fields, depending on dietary preferences. The species' productive capacity in local edaphoclimatic conditions is another decisive factor in the selection and conservation of varieties.

Decentralization, circulation and the cultivation, selection and storage techniques are thus keys to maintaining the system's high degree of agrobiodiversity. Since the flowers-gathering communities joined a regional commission (Commission for the Defense of Sempre-viva Flowers Gatherers' Communities/CODECEX) and began participating in the Semiarid Agrobiodiversity Network of Minas Gerais State, in the past five years they began participating in regional seed fairs for local and landrace varieties. This has further dynamized the spread of new material through the system.

Traditional agricultural practices are also important in this process, such as slash-and-burn (*roça de toco*) and fallowing to replace soil fertility. Biomass is fundamental in this system to ensure the presence of nutrients in these mainly acid and dystrophic soils. Slash-and-burn involves much knowledge that will be developed below, in item 3. There are also blessing (*benzeção*) rituals and charms (*simpatias*) to protect farm plots, as well lunar calendar-scheduled activities and special attention for signs of nature (such as nuances in the rain and draught) that call for actions and care in the fields and other activities.

The logic of cultivating homegardens and crop fields includes attention for the density of planting in small areas and the criteria used to ensure production. Homegardens, near the homes, are mostly less than 0.5 hectares, with polycropping mainly of vegetables, medicinal plants, condiments, several sizes of fruit-bearing plants, native trees, sugarcane, coffee, tubers and grains (in only small quantities in these spaces). In the crop fields, covering

up to 1 hectare each, there is a predominance of consortia rows of maize and beans, as well as fruit and squash; or stands of cassava in consortium with squash, watermelon, *maxixe*, etc.; or grass and sugarcane to supplement the feed for livestock and to produce *rapadura*, along with fruit. In some fields there may be more commercial crops such as cassava and okra, but never larger than 0.5 hectare and always neighboring areas with other crops. One way or another, the crop fields are always near native forest land, as are the household homegardens, and the criteria for selecting where to plant always include bioindicators of more fertile soils (certain trees), moisture and soil types.

Consortia involves plants with differentiated root systems and different heights and architectures. Cropping practices thus promote natural processes and cycles (energy, nutrients, organic material, biotic interactions), the conservation of renewable natural resources (soils, water, biodiversity), savings and independence from non-renewable resources (fossil fuels) and synthetic fertilizers, and low consumption of external inputs, especially dangerous inputs (pesticides, GM crops and anabolic steroids), which may be totally absent.

These characteristics allow for a differentiated occupation of the edaphic space, with a variety of uses of the soil, water, air and light, as well as interactions between fauna and flora (synergisms, complementarities, cooperation, etc.). The integration between crops, livestock and gathering also implies a high degree of species diversity that gives rise to much of the agrobiodiversity for these groups' food, housing, toolmaking, medicinal and religious practices, as well as to their income generation and food security.

It is significant that the communities are selecting material with greater resilience to the climate change now underway in the region, as seen in the longer yearly dry season. Novel technologies and tests to shift crops onto moister plots are also being adopted, to maintain the system's production capacity. This process has been researched with participatory monitoring on socio-ecological resilience, with researchers from the Agroecology and Peasantry Studies Unit at the Federal University of the Jequitinhonha and Mucuri Valleys (NAC/UFVJM), whose indicators defined so far are: soil cover, soil erosion, water autonomy, water retention, native biodiversity, agricultural biodiversity, genetic variability and production for income and for subsistence (NAC/UFVJM, 2016).

The first phase of monitoring found that the local system has resilience factors, especially its high degree of agricultural and native biodiversity, as well as a capacity to retain enough high-quality water, to conserve soil with organic material management (particularly the carbon stored by the system) and to maintain production, in particular for family

consumption (NAC/UFVJM, 2017). On the other hand, however, food production for sale has fallen, larger animals demand more grazing time in the native fields and income from gathering is more significant. The system is trying to adapt by selecting material more resistant to longer dry seasons, adapting the density of livestock in the native fields, better techniques to gather *sempre-vivas* flowers and more, largely agroecological, practices to conserve the system's soil and moisture. Other income sources, such as handicrafts for sale, processing farm produce to add value to sales and access to institutional food markets, are under consideration.

In the areas occupied by the *sempre-vivas* flowers gathering communities, the effects of climate change are also already observed, especially in the lower altitudes that are in contact with the semiarid zones of the state of Minas Gerais. Actually, the annual precipitation concentration from December to March and the temperature increase, especially in summer, are the main effects observed. As a consequence, there are changes in the production system and, at the same time, the strategies that are being used to live with this new reality (NAC/UFVJM, 2019). Following will be listed, from the research that is being conducted, some strategies that are being adopted by the *sempre-vivas* flowers gatherers that reveal the resilience of this agricultural production system to climate change.

- Use of adapted varieties: As already mentioned, in this agricultural production system hundreds of species are managed and, in some species, dozens of varieties that constitute the rich agricultural genetic heritage of these communities and which are materials that were used throughout the period selected and adapted to the different environmental conditions that make up the system. As a consequence of climate change, use and selection of varieties adapted to this new condition is taking place. Examples include shorter-cycle cassava varieties to take advantage of more concentrated rainwater; rice varieties that develop with less water requirement (taken as rainfed rice); and bean varieties more adapted to dry season.
- Modifications to crop arrangements: There are modifications observed in crop arrangements aiming at the use of water during the most concentrated rainfall and the conservation and economy of water in the dry periods, as: the use of more intensive consortiums and polycultures in the fields and backyards in the rainy season and the increase in the cultivation of species that make better use of insolation and resist the dry season (such as sugar cane).
- Water use and conservation: one of the characteristics of Espinhaço Range is its abundance in water, known as the cradle of three important Brazilian watersheds: Rio

Doce, Jequitinhonha River and São Francisco River. For *sempre-vivas* flowers-gathering communities, historically, water has never been a limiting factor to production. It is common to find running water (piped or not) in the yards or near homes. However, in recent years, there has been intermittence in some springs and watercourses. Although this intermittency cannot be attributed solely to climate change, it has certainly influenced on it. In this sense, some strategies for better use and conservation of water in the system used by the families are: use of organic materials as soil cover for longer periods; and greater care in the use of irrigation that occur only in vegetable gardens and crops near the backyards.

On climate change, its impacts at the regional level deserve reflection and attention. In general, the Southern Espinhaço Range has environments of different climatic occurrence from its surroundings with milder temperatures and greater presence of humidity. In the medium and long term, as the tendency is to occur temperature extremes and decrease the presence of water, the semiarid regions will be more severely affected, which may lead to greater pressure on the “mountain” by the resources present there.

The system thus shows vitality in pursuit of its dynamic conservation, facing edaphoclimatic limits and ecosystemic potentials in today’s world, taking advantage of its *elasticity*, which combines to that end both agricultural and native diversity – now involving approximately 460 species. They are thus promoting the co-adaptation of species and uses, integrated with natural, cultural, productive and economic dimensions. The multiplicity of activities is what provides *flexibility* to handle the families’ internal and external contexts. At the same time, it generates new knowledge rooted in traditional practices, in the quest to maintain life, where agrobiodiversity is fundamental. In this perspective, it contributes elements for the day-by-day rebuilding of its own socio-ecological resilience.

3. Traditional and local knowledge systems

Having seen the system’s main components that allow life to thrive in this region, clearly traditional local knowledge systems and their inter-generational transmission to maintain such know-how are fundamental. This way of being, creating and doing is part of a way of life with social, cultural, environmental, economic, religious and political dimensions. That knowledge provides the widespread recognition of native flora and fauna, considering habits, habitats, occurrence, multiple uses and significance. It is part of people’s food, housing, tool-making, medicinal and religious strategies, as well as their income generation.

Their knowledge about local agro-environments also allows them to find more suitable locations for crops, grazing and gathering. This is important for their food, health, housing, etc.

Costa Filho (2014) identified a broad repertoire of traditional medicine practices in the *sempre-vivas* flowers-gathering communities. When asked whether they use traditional medicine to treat and cure illnesses, 44.94% of the people answered that they use medicinal herbs from the forest, 38.12% use blessings; 0.47% resort to healers; 12.18% use charms; and 1.18% use other traditional forms of healthcare. Most of the houses are built mainly with adobe (45.81%) or masonry (45.32%). 45.81% of households have septic tanks, and 45.32% have dry pit latrines. In nearly all cases people are treated and their homes built with local material, since adobe is a technique that uses clay, grass and water.

The traditional knowledge is also important to identify the different types and habitats of *sempre-vivas* flowers and its sustainable management. Field management, manual collection, processing and conservation, even the commercialization of flowers, involves a set of traditional knowledge associated with each of its stages. Field management using controlled fire requires knowledge of the appropriate time (after the first rains), the most appropriate time of day (the coolest hours, early morning or late afternoon) and the wind direction, in addition the need of firebreaks to prevent the fire spreads to other areas. The act of collecting varies from species to species and requires specific techniques, depending on the species, so that the base of the plants is not harmed and allows the budding and reproduction of individuals.

Once collected, the flowers are scattered on the ground near the houses to dry in the sun. Drying time varies according to each species and requires specific knowledge, which will influence the quality and time of conservation of the flowers. After drying, the flowers are arranged in portions and tied, usually with strips of plants, and are stored in a sunny and ventilated place (ranches) until they are marketed. One practice adopted by *sempre-vivas* flowers gatherers is to collect the seeds that lie on the ground in the drying and storage places to be thrown into the fields (called enrichment). As mentioned, it is a set of traditional knowledge passed down from generation to generation that enables the continuation of this fundamental activity for maintaining the way of life of *sempre-vivas* flowers gatherers.

Each community has well-established the community land limits, and the other neighboring communities recognize such limits. In addition, access to native fields, where native flowers and native pastures are located, is accessible to families in each community.

Still, families constantly monitor their lands in order to maintain community control over ancestral lands. In addition, the 06 communities involved in this dossier have recently developed the prior consultation protocol based on Declaration 169 of the International Work Organization and respected by Brazilian laws. Thus, any interference in their ancestral lands, as access to biodiversity and associated traditional knowledge, must comply with the rules established by the Community's prior consultation protocols. This is one of the ongoing actions under the Dynamic Conservation Plan (as part of this dossier) to empower such groups to protect them from threats of biopiracy and invasion of their ancestral lands.

The traditional knowledge is also important for fishing. In some communities of *sempre-vivas* flowers gatherers, especially those near the Jequitinhonha and Curimataí Rivers, artisanal fishing is practiced for self-consumption by families at certain times of the year. Artisanal fishing is done with simple instruments consisting of bamboo rod, line and hook. The main species fished are local such as “lambari” (*Astyanax fasciatus* sp), “cascudo” (*Delturus brevis*), “piabanha” (*Brycon devillei*), “curimatá” (*Prochilodus nigricans*) and “piaus” (*Leporinus* sp).

Near the homes, people build their infrastructure to process cassava, sugarcane and maize and to store seeds and various kinds of food, as well as equipment like work tools, ox carts, carriages, etc. (see Annex 03). Cassava flour production is an event that brings family members of all ages into the various stages: peeling, grating, pressing and roasting. The production of *rapadura*, from sugarcane, also brings families together and involves the use of animals (see Annex 03). To build and maintain this equipment also requires know-how, and the structures and equipment are shared within and among families.

Women prepare much of the food, and their knowledge is passed on through generations. Children are always accompanied by their parents as part of family and community dynamics, except when they are at school. Children are generally socialized into the working environment around the age of seven, mainly with their mother's housekeeping activities, to which they pay close attention. Only years later do they actually take on responsibilities alongside their parents. They earn their first income, normally, as adolescents, gathering flowers in the native fields. Children also often are given a “lucky” animal by their parents or godparents, to begin their own herd of horses, cattle, pigs or chickens. This promotes a notion of responsibility, as well as to amass their own assets to “begin life” and “prosper.”

It is essential in this system to learn about the mosaic of soils, nuances of the yearly seasons with the cycle of waters, lunar cycles and the time to use cultivated pastures (in the

lowlands) and native pastures (in the highlands), the great inter- and intra-specific biodiversity adapted to the mosaic of agro-environments, the cycling of nutrients to promote natural soil fertility in the crop fields they cultivate and in the grazing pastures, as well as crop rotation and fallow in farm areas to produce biomass, which is a source of diversity and of nutrients, and techniques for crops, livestock and gathering developed through the use of the entire potential of the ecosystems, generating food security, income and resilience. This complex knowledge ensures the groups' social and cultural reproduction and enhances their social, productive and economic organization, aligned with the availability of resources and natural cycles.

Pierre Bourdieu would say that the calendar is their organizational principle (regulating temporal succession) and integrating force (ensuring harmony among individual behaviors and the reciprocal meeting of expectations regarding behaviors). The calendar for work and for festivals institutes the group's cohesion, blocking any exceptions to collective forecasts while ensuring predictability, with no need for science or economic calculations. As that author has put it:

Social order is, first of all, a rhythm, a time. To conform to the social order is essentially to respect the rhythms, keep to the metrics, not walk out of step. Belonging to the group means having at the same moment in the day and the year the same behavior as all the other members of the group (BOURDIEU, 1979, p. 47-48).

In this sense, slash-and-burn agriculture (*roças de toco*, also known as *roças de capoeira* or *roças de coivara*) is essential and brings together all these elements. When a young man is preparing to marry, he generally begins his own crop field that will provide food for the new family. This is generally done on the land of the groom's parents, where the couple will set up housekeeping. If they must go to the home of the bride's parents, which is not at all common in the region, the custom is to work on the father-in-law's crop field for a time to "pay for the bride." The homegarden is set up later, once the couple is settled. The homegarden is a year-long productive unit, located near the home, generally close to a waterway to irrigate the vegetables either with hoses or with manual watering cans. Where soils are moist they can have two harvests of beans and the cassava can be cultivated and harvested year-round.

There are two kinds of cassava. “Sweet” cassava can be cooked and eaten, while “bitter” cassava is used to make flour and is too toxic to be consumed directly, due to its high content of hydrocyanic acid. In this region, people know how to prepare bitter cassava for consumption, if necessary. There are other foods that are important for times of scarcity – caused in the past by restrictions on access to ancestral farm lands, during the “more difficult periods” which are part of people’s social memory – such as fern sprouts, native *Embaúba* sprouts and yam leaves. There are specific techniques for cooking those foods.

The *roça de toco* is an age-old system used by traditional peoples of the Americas, and are fundamental in these systems:

Armed with relatively efficient polished stone axes to cut bushes and trees, but with only a bladed planting stick to work the soil, Neolithic farmers in fact were better prepared to clear and cultivate a forest than to clear and cultivate a dense grassy carpet. That is why Neolithic populations who settled in tree-covered regions widely developed crops (MAZOYER and ROUDART, 2010, p. 131).

The *roça de toco*, or *capoeira* or *coivara*, widely known in English-language literature as slash-and-burn agriculture, is a millenary practice, going back to the birth of agriculture and still a fundamental part of heritage agricultural systems. Practiced in a variety of tree-covered environments, from dense forests to tree-covered savannahs (MAZOYER e ROUDART, 2010), it involves opening clearings with sickle and fire, to cultivate the area for a given period, followed by a longer period of lying fallow. Pedrosa Júnior et al. (2008, *apud* McGrath, 1987) define it as “a resource-management strategy in which fields are rotated to exploit the energy and nutritional capital of the natural soil-vegetation complex of the forest, often providing the only source of nutrients for the crop fields.”

Using the concept of cultural forests, several experts contend that today’s tropical forests evolved together with the use of slash-and-burn farming and that their great biological diversity arose from that long-standing practice. This is particularly valid for Brazil’s Cerrado region that, according to several studies, evolved with the presence of fire (LEHMANN, et al., 2014; PINHEIRO and MONTEIRO, 2010; PINHEIRO, 2010; COUTINHO, 1981). As argued by Pedrosa Júnior et al. (2008), many studies have shown that human interference through farming in the successional process of the forest as a source of variability,

maintaining or even enhancing regional biodiversity (RAMAN, 2001; GUPTA, 2000; ALTIERI, 1999; NEVES, 1995; ANDRADE & RUBIO-TORGLER, 1994).

Slash-and-burn has been practiced in nearly all of Brazil's biomes and regions, especially in the Amazon, Atlantic Forest and Cerrado biomes. According to Homma et al. (1998), in the Amazon alone it is responsible for feeding some 600,000 traditional farming families. In the traditional agricultural system of sempre-vivas flowers gatherers, slash-and-burn is a cultural legacy and a key component for their maintenance. There is no single pattern for using the technique in the different agro-environments of the sempre-vivas flowers gathering communities. Most often, slash-and-burn is used on flat lowlands, but it can also take place on hillsides, at different altitudes and sunlight conditions. The plant cover in these areas is secondary growth and remnants of semideciduous seasonal forests, gallery forests, Cerrado and transitional phytophysiognomies between these biomes.

The soils found in the sempre-vivas flowers gatherers' lands are mostly sandy, with few available nutrients (dystrophic). They prefer areas with more organic material (darker soils) or with a little more clay to do their slash-and-burn. Other criteria also come into play, such as the distance from their homes and the climate variations in recent years, especially the occurrence of prolonged droughts or floods.

In general, men and women participate in all stages, while children (beginning at 7) plant seeds. Adolescents help with crop field work such as manual weeding and harvesting ("breaking the maize" and harvesting other crops). The slash-and-burn cycle in this traditional agricultural system can be broken down in three stages: (a) slash-and-burn, (b) cultivation and (c) fallow.

Slash-and-Burn – The slashing or clearing comes near the end of the dry season. Low-lying and bushy plants are cut with machetes, sickles and axes. Trees are not cut down, except when they have finished their vegetative cycle, have dried, and can be used for firewood or construction. Community members call this clearing activity: "*mato fino*" or "*gramear*", in a reference to the shrubs and grass, and they leave the "*mato grosso*" or thick woods standing in the middle or around the crop field. They understand that if the plant cover is very thick it is not a place to cultivate, but to preserve as a source of water. Only less dense areas are cultivated, and always at a distance from springs, which must be protected. They know the local species whose presence indicate "good" land to be cultivated.

The slashed material is spread out to dry on the ground. At the beginning of the raining season, after the first showers and during a "sun break," they set fire to the dried

material. The fire is set during cooler hours, early in the morning or late in the afternoon, usually after opening a fire break around the area to be burned, by raking away a strip of the dried material, to keep the fire from spreading to neighboring areas. After the first burn, if there is still much material left covering the ground, it is piled into windrows they call “*coivaras*”, which may also be burned again.

Out of caution, the fire can only be set by very knowledgeable people, as long as they do not have “energy” to make it burn for a long time. People who “walk a lot” cannot set fires either because they make the fire spread and “walk away,” meaning a risk of causing a forest fire. They also do it with matches, using a “charm” to burn right. Some people are brought in from other areas, who “know how to set a fire”. They take great care with the firebreaks, light the fire in the middle of the field and use the “fire prayer” if needed to help put it out. The locals show great skill and know all the details for managing the burning, as well as different names for the “types of fire,” depending on their format and strength.

We observe that the procedures adopted by the *sempre-vivas* flowers gatherers are not guided only by technical criteria but also by metaphysical and cosmological precepts. For Leach (1996, p. 74-75), an eminently technical act like clearing a field can take on magical overtones, as a socially ordered and standardized action, adorned with technically superfluous ornaments. That difference makes the activity, more than a functional activity, a cultural performance by the *sempre-vivas* flowers gatherers.

Cultivation – After the field is slashed and burned, the cultivated species are planted. Before planting, the area is usually fenced in to keep out larger animals (cattle and horses). At times, when there is still a lot of burned material on the ground, and depending on the crop to be planted, the ground may be raked into windrows. They say this is necessary for rice and beans. They also “cut” the ground with shovels, or plough to soil to “soften it and mix in the ashes.”

They plant (or bury: “*encovar*”) the seeds in small holes in the ground, using hoes of different sizes or, in some cases an instrument they call a “*matraca*”. In this activity, generally the women and adolescents open the holes and the children come behind to plant the seeds and fill the hole (“seed and close,” they say).

The crop fields of *sempre-vivas* flowers gathering communities are diversified in terms of crops and of varieties of each species. One crop they always grow is cassava. Others include maize, beans, pineapples, squash, sugarcane, etc. In some locations, where crop fields are planted in moister soil, like in the Vargem do Inhaí community, they also grow rice

(Figure 27). The species to be planted and the size of the crop field depends on the family’s food needs for the coming year and, possibly, their expectations for being able to market their produce (cassava flour, corn meal, *rapadura*, etc.).



As observed by Pedrosa Júnior et al. (2008, *apud* ALTIERI,1999), the inter- and intra-specific diversity of crops allows populations practicing slash-and-burn agriculture to enjoy a more diversified diet, stabilizes their production, minimizes risks, reduces pest and blight problems, rationalizes the use of family labor, increases production with limited resources and maximizes returns.

After the maize is harvested, it is common to let the cattle in to eat the stubble (“*palhada*”). A single maize field can be weeded twice a year, the first time to cover the crop’s roots. After the harvest, the cobs are dried in the sun and stored in a silo, with the husks, while the beans are bagged. In the silo, saints’ images and flags are also stored, by the Catholic groups, to protect the harvest. The seeds are selected and stored in bottles and gourds with ashes and fine sand, to protect against pests until the next planting season. Cassava is managed in harmony with the phases of the moon and conserved in the earth for the next crop.

While the homegarden has “a little of everything,” the crop fields necessarily have cassava, potatoes, yams, sugarcane, maize and beans. In the first four of these crops, there is a right way to position the seedlings in the holes, to be sure they will bloom. These are the crops found to be the most resilient to climate change and considered “safe.” Maize and beans, meanwhile, can take greater losses in today’s climate conditions. In the homegarden, with irrigation and moister soil, the crop is also considered to be “safe.”

There are also crosses and animal horns in the crop fields, to “protect against the evil eye” in Catholic communities. Old timers would also place a cross or scarecrow in crop fields that had not been cleared for some time, to draw the “plot owner’s” attention to the growing need for care in his plantation. On Three Kings’ Day, the crop field must have been weeded. There are customs to divine which months will bring rain, to plan the next crop, using Catholic saints. Processions are also organized to ask God for rain, with people carrying water jars (or stones) on their heads to the highest point in the community, where they “water the foot of the cross.” Nowadays, this practice has been updated into a collective prayer service in Protestant communities. All these practices are considered rituals to favor a good crop, a good harvest and the vitality of a system to provide food and marketable produce.

Slash-and-burn areas are cultivated continuously for three to five years and are then left fallow. Community members explain that the time to leave a field fallow is when the plants of one of the species no longer produce the yield expected of that variety.

Fallow – After the period of cultivation, the slash-and-burn areas are left to “rest,” as the locals say, to regrow the native vegetation and recover soil fertility. The fallow period in the *sempre-vivas* flowers gatherers’ traditional agricultural systems is from five to ten years. In some cases, they say it was longer in the past but has declined due to the reduction in the areas available to communities that are suitable for slash-and-burn approaches.

Another reason the fallow period has been reduced is that recent climate changes, with longer dry seasons and higher temperatures, have affected crop yields. Lower yields require more acreage to plant and this reduces the leeway for a fallow-plant-fallow cycle. In response, one alternative adopted by families to replenish soil nutrients and avoid lower yields has been to introduce leguminous plants as fertilizers between the rows of other crops during cultivation (Figure 29), as well as to use animal manure in the homegardens, whose locations are also periodically left to fallow.

The slash-and-burn cycle concludes, after the fallow period, with another slash and burn, launching a new cycle. In the sandy, dystrophic soils prevalent in *sempre-vivas* flowers

gatherers' traditional agricultural systems, soil fertility and the supply of nutrients to plants in slash-and-burn depend basically on mineralizing the organic material accumulated during the fallow period. The way this material is burned, with high relative humidity early in the rainy season, with the soil damp, promotes a partial mineralization, since it does not burn all the material that is cut down, and has no negative impacts on the action of soil microbes. The rest of the material decomposes and is mineralized by soil organisms during cultivation.

Chart 1 presents the outcome of soil analyses in different environmental segments of a heritage agroecosystem managed by *sempre-vivas* flowers gatherers. The recently opened area, immediately after the slash-and-burn, has a pH and quantities of total organic material and of nutrients available in the soil that are higher than in the fallow area after five years, in the permanent grazing pasture (cultivated) and in the unfarmed area (*Stricto Cerrado or Savannah Stricto Sensu*), where there are agro-extractive activities. In the five-year fallow area, it is worth noting that although its pH and its total organic material and nutrient content is less than in the recently opened area, as a consequence of extraction by the crops, even so its values are similar to or higher than those in the cultivated pasture and the Cerrado areas.

This data points in the same direction as observations by Oliveira (2008) in Brazil's Atlantic Forest, where nutrient capture mechanisms are reconstituted after approximately five years of fallow on the farms. Other studies by Frizano *et al.* (2003) and Johnson *et al.* (2001), quoted by Pedroso Júnior *et al.* (2008) concluded that the impacts of slash-and-burn agriculture on the stocks of Carbon (C), Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca) and Magnesium (Mg) are not enough to compromise secondary forest growth in the Amazon.

Chart 1 – Results of soil analyses at 0-20 cm depth in environmental units of a family's agrosystem in the Vargem do Inhaí community, Diamantina, MG:

Environmental Units	Sand	Silt	Clay	TOM	pH	Ca	Mg	K	P	Total
	%				H ₂ O	kg/ha				
Recently opened area	64	30	6	2.08	5.0	240.0	168.0	67.6	9.20	484.8
Fallow area (5 years)	83	10	7	1.16	4.8	120.0	256.0	65.0	5.24	446.2
Pasture	88	8	4	0.88	4.9	120.0	224.0	57.2	5.91	407.1
Stricto Cerrado	88	8	4	1.28	4.7	66.7	208.0	62.4	4.92	342.0

TOM = total organic material; pH = hydrogenionic potential measured in water; Ca = calcium, Mg = magnesium, K = potassium, P = phosphorus. Source: NAC/UFVJM (2017).

It is noteworthy that for soil conservation, as mentioned, there are three situations in which slash-and-burn are practiced: in flower collection native fields, native pastures and crop

fields. In neither of these situations does soil tillage occur. Thus, the original structure of the soil is not impacted by the forms of use and management adopted. With burning, part of the organic material that is above the ground surface is mineralized, thus leaving the part that is not mineralized protecting the soil.

On the other hand, the organic material that is in the soil and composing its structure is conserved. As burning is practiced shortly after the first rains, when the soil is moist and nutrients are available through the mineralization of part of the organic material, the sprouting of native species in the collection fields and native pastures, and the growth of species cultivated in the crop fields, occur rapidly promoting the soil protection. One technique performed by community members is green manure with fast-growing leguminous species associated with crops as a means of protecting the soil and promoting nutrient cycling. In addition, they use mulch from crop residues and spontaneous species over the years they cultivate in the area between fallow seasons to cover the soil and its protection.

Despite the need for medium- and long-term monitoring of the performance of slash-and-burn, principally regarding recomposition of forests and recovery of soil fertility, this practice has been in use in this heritage agricultural system ever since it began, and has supplied much of the families' food. It endures due to the treasure of agroecological knowledge held by traditional *sempre-vivas* flowers gatherer communities on how to manage interactions among the various agro-environments and the diversity of species they cultivate.

Following there is an example of the sequence of the "roça de toco" (slash-and-burn practice) in the Vargem do Inhaí Community, explaining the calendar and cycle in terms of years or even crops and its interactions with soils conditions connected to traditional knowledge:

- Realizing that the native vegetation has already reached a good stage of regeneration, observing the presence of certain indicator plants, such as the "aroeirinha", they wait the end of the dry season (near the arrival of the rains) that occurs in September/October and cut the finest plants (herbaceous and shrubby);
- After the first rains, the mowed material is burned, which is already dry, according to the procedures previously described;
- After burning the mowed material the area is ready for cultivation. With the mineralization of the burnt material, the soil has good nutrient availability and higher pH and, therefore, in this first year of cultivation are cultivated more demanding species in fertility such as rice, beans, corn, pumpkin, watermelon and okra. Also cassava, "andu" and pineapple which are less demanding, are cultivated.

To define the time of cultivating (and even harvesting) of the different species, they observe the phases of the moon. For example, beans are planted on the crescent moon and harvested on the waning moon. Otherwise, it will be heavily attacked by “carunchos” (*Acanthoscelides obtectus*), as they say. Management practices such as hand hoeing, thinning and pruning of the trees that stay in the crop are performed during crop development, depending on each species. Annual cycle species are harvested from January/February and cultivated again in the next rainy season (October/November). Longer cycle plants, such as some varieties of cassava and “andu”, can remain vegetating from year to year throughout the dry season.

The most nutrient-demanding species are grown until the second or third year. The less demanding ones are grown for more 2 years in the same area. When they perceive lower plant development and lower crop productivity, they begin to decrease the crops and then leave the area fallow for regeneration. Two aspects are fundamental in the sustainable management of water resources: conservation and direct management by communities. Regarding the conservation of water resources, the communities organize the use of agroenvironments in order to conserve recharge areas and protection of springs. Regarding management, communities seek to ensure access to water for all families of each community through piping of springs or rivers. This management is done internally by the families of each community without state interference.

The flowers gatherers’ way of life bears meanings and practices about being, creating and doing that have evolved over centuries of co-adaptation with their surroundings, to make the *Southern Espinhaço Range* a wellspring of water, agrobiodiversity and traditional knowledge associated with this unique *agriculture*. It conserves the Brazilian Savannah, with a high degree of biodiversity, genetic resources adapted to adverse conditions, rare endemic species and domesticated food species, along with vast knowledge associated with an amazing agricultural and biocultural heritage, in a unique managed landscape, as we shall see below.

Knowledge and domestication

Archaeological, genetic and ecological evidence indicates that human populations have intensely managed all the globe’s land environments for thousands of years, suggesting that the entire earth is a mosaic of anthropogenic environments (WILLIS et al., 2004, ROSS, 2011, CLEMENT et al. al., 2015, BOIVIN et al., 2016). These typical studies of Historical Ecology (BALÉE, 2013) argue that, in addition to taming animal and plant species, human

groups, rather than transforming, were able to *domesticate whole landscapes*, altering their evolutionary ecological dynamics to make them more productive and meet humans' material demands (CLEMENT et al., 2015). This perspective dialogs with *Niche Construction Theory*, in showing that all living beings, including human beings, through their activities and decisions, modify their own niches, as well as other organisms (LALAND, 1996; ODLING-SMEE, 1996). Thus, by changing niches, organisms could also change natural selective pressures.

Several studies by researchers at the National Amazon Research Institute (INPA), led by Charles Clement, have proven that various strategies used by over eight million indigenous people living in the Amazon basin before the Europeans drastically and almost irreversibly altered the landscape (CLEMENTE et al., 1999; CLEMENT et al., 2015). Examples of those strategies include changes in the floristic composition, selection of propagules, species breeding, structural changes in the soil, use of fire, genetic diversification through the domestication of species and the development of complex knowledge systems that enable the maximum use of socio-biodiversity. Currently, their research has gone further and confirmed that the Amazon Rainforest is an anthropogenic formation, that is, all of its structure and dynamics were and are influenced by human management (CLEMENT et al., 2015).

In an attempt to build a theoretical model able to respond ecologically to the processes of domesticating landscapes, Levis et al. (2018) identified eight essential types of management corresponding to "domestication syndromes": 1) removal of non-useful species, 2) protection of useful species, 3) attraction of animal dispersers, 4) intentional or non-intentional transport of useful plants beyond their geographical boundaries, 5) phenotypic selection, 6) fire management to increase soil fertility, 7) planting of species and 8) soil enrichment. These eight processes are the basis for recognizing "human marks on environments", basic evidence of the domestication of the landscape.

Taking this model as a reference, our analysis of different human management practices carried out by *sempre-vivas* flowers gatherers, ever since their ancestors, allows us to envision that, like the Amazon Forest, the mosaic of the Southern Espinhaço Range in Minas Gerais has been domesticated and is, therefore, an ingenious human construct. This analysis, based on data and field observations, is described below, for each domestication syndrome.

1) Removal of non-useful species – Various management practices by *sempre-vivas* flowers gatherers fit in this syndrome, such as the elementary case of using fire to benefit species of

local economic importance, in this case the "sempre-vivas flowers." These species, from the *Eriocaulaceae* family, occur, as seen above, in the *campos abertos* (open grasslands) and, in the context of ecological succession, are pioneers. As the plant community develops, new species are included, such as grasses, which are more effective in interspecific competition. As a result, there is an increase in biomass and the consequent competitive exclusion of sempre-vivas flowers. Aware of this ecological process, sempre-vivas flowers gatherers use fire under controlled conditions to keep the plant community in initial stages of succession, thus favoring the species of interest.

Another example of this process involves the homegardens. Several plant resources available in these agro-environments, especially fruits, undergo an intense selection process. Species and varieties, regardless of whether they were planted intentionally or spontaneously, are evaluated for taste, sweetness, texture and yield. If they do not suit the family's interest, they are suppressed. Therefore, the removal and consequent phenotypic exclusion is, in the homegardens, an *a posteriori* event. It is believed that the evolutionary result of this ecological process is the genetic alteration of the cultivated species.

2) Protection of useful species – This protection is observed in a variety of management activities. In the context of the Cerrado's native diversity, one important species is *pequi* (*Caryocar brasiliense* Cambess.). The Cerrado's phytophysiognomies are used by sempre-vivas flowers gatherers to gather plants, for grazing and for their crop fields. In situations where conversion is required, *pequi* trees in the area are fully protected, unlike many other species, thus demonstrating the regional esteem for this species.

Similar situations occur when native areas are converted to homegardens. When a new house is built, a new homegarden is set up, eliminating nearly the entire native plant cover, except for species the family will continue to use, like the *uruvaieira* (*Eugenia* sp.), the *mutamba* (*Guazuma ulmifolia* Lam.) and the *páu d'óleo* (*Copaifera* sp.). In these cases, various resources are preferred and defended.

3) Attraction of animal dispersers – The same niches planned as reserves for food and medicinal resources attract birds that disperse seeds and promote these species throughout the region.

4) Intentional or non-intentional transport of useful plants beyond their geographical boundaries – This syndrome is also widespread and has various facets. The normal dynamic

of *sempre-vivas* flowers gatherers includes walking for hours or even days to shepherd the cattle grazing in the mountains and to gather *sempre-vivas* flowers. This activity consumes much energy and demands food along the way. At various points in the mountains one sees niches built by residents to ensure food along the routes they use. In general, this benefits fruit trees typically found in their homegardens, such as mangos (*Mangifera indica* L.), papaya (*Carica papaya* L.) and orange trees (*Citrus* sp.). There are also native species, such as *araticum* (*Annona coriacea* Mart.), *mangaba* (*Hancornia speciosa* Gomes) and *ingá* (*Inga* sp.).

This syndrome is explicit in the “*lapas*” (*grottos homes in the mountains*), where flowers gatherers live while working in the highlands. In some cases, they set up homegardens around their “*lapas*”. One clear example, in the Mata dos Crioulos community, is the Guava Lapa, obviously named for the single guava tree purposely transported there. Actually, not all the resources transported like this are for food. There are also medicinal herbs, for example tobacco (*Nicotiana tabaco* L.).

5) Phenotypic selection - The dynamics of *sempre-vivas* flowers gatherers’ homegardens include processes corresponding to this syndrome. During the process of planting new homegardens, plant propagules from old homegardens are a germplasm bank for the new ones. The selection of propagules is not random, but depends on a family’s preferences. In this sense, the agrobiodiversity in a new, secondary homegarden is the result of some drastic selection events, and thus amounts to an adapted genotype diversity.

More critical than the intentional selection of existing genotypes is the interbreeding of nearby individuals or species to produce new varieties. In the *sempre-vivas* flowers gatherers’ traditional agricultural system, the cultivation of pineapples (*Ananas comosus* (L.) Merr.), one of the Brazil’s domesticated species, is frequent. A wild species of *Ananas* occurs in the “*tabuleiro*” (“trays”) agro-environments (*Cerrado Stricto*). In homegardens established near Cerrado areas, morphological characteristics in the cultivated pineapples frequently appear, due to intercrossing. This process allows us to perceive that genotypic diversification, the basis for expanding agrobiodiversity, is still underway.

A different genetic selection process involves the *gondó* (*Erechtites* cf. *valerianifolius* (Link ex Spreng.) DC.), a medicinal herb long used in the diets of local *quilombola* communities to fight sickle-cell anemia, a recurring disease for this group of Afro-descendants. Bromatological analyses confirm its high iron content. The species is

native to the region and residents collect seedlings found in the areas where it naturally occurs and take them to plant in their homegardens.

At first, the initial selection of individuals in areas where they naturally occur favors certain phenotypes, for example, those that have more leaves, the food resource. When grown in homegardens, the genes conferring this characteristic are, therefore, completely fixed in the managed population, which is a drastic modification. However, it is possible that a phenotype recognized by locals as special may be reproducible through vegetative propagation, a cloning processes that can multiply and exponentially favor a set of genetic traits. Nowadays, locals have begun to differentiate a “bitter” gondó from the “sweet” gondó, a trait unknown in the literature on this species and a possible indication of genetic alterations, which are now undergoing further study in our research.

6) Fire management to increase soil fertility – Fire is used by *sempre-vivas* flowers gatherers in the fields, to reduce inter-species competition and favor the preferred species, stimulating the regrowth of *sempre-vivas* species and of native pastures, as well as in the crop fields, as discussed above. In all cases, agro-environments have co-evolved in the presence of fire and depend on fire for their maintenance, to enable their traditional agricultural use. In addition to stimulating the sprouting of desired species, fire burns the biomass of the material that has been slashed (in the slash-and-burn system) or that comes from senescent species (in the fields), providing organic material in an advanced stage of mineralization and nutrients that will be easily cycled to enhance soil fertility.

7) Planting of species – While gathering the *sempre-vivas* flowers, the gatherers leave behind some flowers stalks, which they call “stubble”, to generate the seeds that will maintain the species targeted for gathering. In addition to protecting the seeds in the field, during the process of bundling collected flowers for transportation, the gatherers gather seeds that naturally fall on the ground, and plant them in native flower fields. The ecological outcome is the *enrichment* of managed plant communities, dominated by the species of interest, very much like the monotypic areas of *açaí* and Brazil nuts, in the Amazon basin.

8) Soil enrichment – During the months when *sempre-vivas* flowers gatherers live in their “*lapas*”, they often raise pigs and chickens nearby. Today they also are known to keep pack animals (horses and mules) tied up around the “*lapas*”, ready for their daily trips in the fields during the dry season. These animals’ feces contribute organic material and nutrients to the

soil. Another noteworthy example is the chickens foraging in the fields around termite mounds, which are often removed for chickens to feed on the termites. While looking for termites, as the chickens scratch the topsoil, they boost the incorporation of organic matter and the cycling of nutrients.

All these landscape domestication syndromes can only materialize in the presence of a complex knowledge system on the landscape and on the cultivated and managed biodiversity. There is ample evidence to assert that the Southern Espinhaço Range, in the areas occupied by *sempre-vivas* flowers gatherers, is tirelessly managed, meaning that the distribution and structure of the plant communities in these spaces has been and continues to be directly influenced by the local human populations.

Fire is used as part of the traditional management of the *sempre-vivas* flowers gatherers communities in the Southern Espinhaço Range (MG/BR). Not unlike earlier understandings of the role of humans in the structure of ecosystems, ecology also entertained a conservative outlook in which the distribution of species over space and time was caused only by climate and edaphic variables (PAUSAS e KEELEY, 2009). Today, fire has been understood as a widespread process in all land ecosystems, which determines ecosystemic dynamics (BOND et al., 2005).

In the Cerrado, Brazil's savannah, fire is known to play a fundamental role, especially to break the dormancy of the flora's seeds (LEHMANN, et al., 2014; PINHEIRO and MONTEIRO, 2010; RAMOS-NETO and PIVELLO, 2000; COUTINHO, 1981). The Cerrado is the biggest savannah area in South America, characterized by an herbaceous stratum of grasses, shrubs and twisted trees (RIZZINI, 1997). During the rainy season, there is a high production of biomass that dries out as the dry season progresses, favoring the occurrence of fires. According to Miranda et al. (2009), for thousands of years, natural fires during the Cerrado biome's rainy season coexisted with anthropogenic burnings during the dry season, suggesting that fire, together with seasonal rainfall and dystrophic, acid soils, is a determining factor of the form taken by vegetation in the Cerrado. So, fire's influence on natural dynamics in the Cerrado (see MIRANDA et al. 2009, LEHMANN et al. 2011, STAVER et al. 2011, STAVER et al. 2011) thus indicates that fire patterns have historically determined the very structure of its biodiversity (DURIGAN and RATTER 2016, SCHMIDT et al. 2018).

In this way, a central element of traditional agro-extractive management by these communities is the controlled use of fire in the Savannah. Fire is used mainly to manage

native pastures in the mountains to stimulate the regrowth of grasses in the rainy season. In general, residents believe the best time for burning is between September and November, after the flowers are gathered, after the first rains and at times when the sun is weaker (early morning or late afternoon), for ease of control (keeping the fire away from thicket and forests where springs surface and must be protected). Forest areas and springs are often protected by firebreaks,²⁵ and by observing the direction of the winds. The same area, depending on its location, can be burned at intervals of two or more years, based on features such as soil, plant cover and moisture.

The communities are aware of and reaffirm those customs, and when a resident ignores them they may be criticized by the neighbors, as a social-control mechanism. The knowledge regulates customs and guides the use of other natural resources, to ensure the system's long-term survival, especially in terms of procedures for flowers gathering and for harvesting medicinal herbs, oils, fibers, lumber and others. The density of herds grazing in the mountains is also important to avoid stomping in the flowers' environments, although the pasture grasses for cattle are not the same ones from which they gather flowers. In short, much care goes into the adequate use of forest resources and the conservation of natural resources. They also have norms for caring for the wild fauna, and its role in keeping the entire system alive.

As described, fire is also useful to accelerate the cycling of nutrients in the biomass of slash-and-burn systems. Fallow and crop rotation cycles produce biomass that will later be burned to recycle nutrients. This slash-and-burn in shifting crop systems has been practiced by native Americans for thousands of years, to raise soil pH and release nutrients, as we will explain better below. Residents often say that certain flower species respond well to fire, which helps them regrow, and that certain grasses must be burned, especially in moist areas, to keep them from growing so high they shade the flowers from the amount of light they need to blossom. For the bud flowers, in general, no such need for or effect of burning is perceived.

It means, fire is used by flowers gatherers in the fields to reduce interspecific competition and favor desired species, stimulating the regrowth of *sempre-vivas* species and native pastures; besides being used in the crop fields. This system's agro-environments have acid and dystrophic soils and lower average atmospheric temperatures than the rest of the Cerrado. These conditions result in low biological activity in the soil and, therefore, low rates of organic matter decomposition and mineralization. The mineralization of soil organic

²⁵ Firebreaks are strips around an area to be burned, made by clearing organic material on the ground, thus keeping the fire from spreading to nearby areas.

material with fire is therefore fundamental, to accelerate the nutrient cycle and make nutrients available in the soil for plant nutrition.

Consequently, the various ornamental species are only abundant in the native fields, making the Southern Espinhaço Range landscape unique and uniquely beautiful among Brazilian landscapes, because of its traditional, heritage form of management. Just as homegardens and crop fields that "wander" renew this landscape, relaunching ecological successions in time and space, producing a mosaic of forests in different successional stages, the management of pastures and rustic cattle is fundamental for controlling the production of biomass with a high potential for the combustion of its herbaceous material, and is also therefore a natural control for burning and production in these agro-environments that make up the landscape managed by *sempre-vivas* flowers gatherers.

Thus, the use of fire is present in agriculture-pasture-flower management and becomes central in the management of agro-environments, which has a dynamic expressed by the mosaic structure of this landscape, as detailed in the following figure:

So, the use of fire is thus a central landscape-management element here for agriculture, livestock and flowers. This of course does not mean forest fires, but only traditional landscape management with high biodiversity, where it plays a role and requires complex knowledge to be used. This explains why laws in Brazil differentiate between different systems,²⁶ such as *flowers gathering*, where the traditional, local use of controlled fire is allowed and should be refined to ensure the system's sustainability. Those practices are correctly seen as part of a system adapted to the dynamics of the local ecosystem and capable of generating and maintaining local biodiversity. In any case, research is underway to further the understanding of those ecological dynamics, to orient best practices for fire as part of the management of *sempre-vivas* flowers, slash-and-burn systems and the landscape as a whole – as we shall explain in greater detail below. The communities of flowers gatherers are also working for the legal recognition and regulation of their extractive profession, to ensure its continuity.

²⁶ Federal Decree 6040 (2007) enacted the National Sustainable Development Policy for Traditional Peoples and Communities. Its objectives, set forth in Article 3, are: (i) to ensure traditional peoples' and communities' rights to their territories and access to the natural resources they traditionally use for the physical, cultural and economic reproduction (art. 3, I); and (ii) to resolve and/or minimize conflicts arising from the establishment of Integral Protection Conservation Units in traditional territories and to promote the creation of Sustainable Use Conservation Units (art. 3, II).

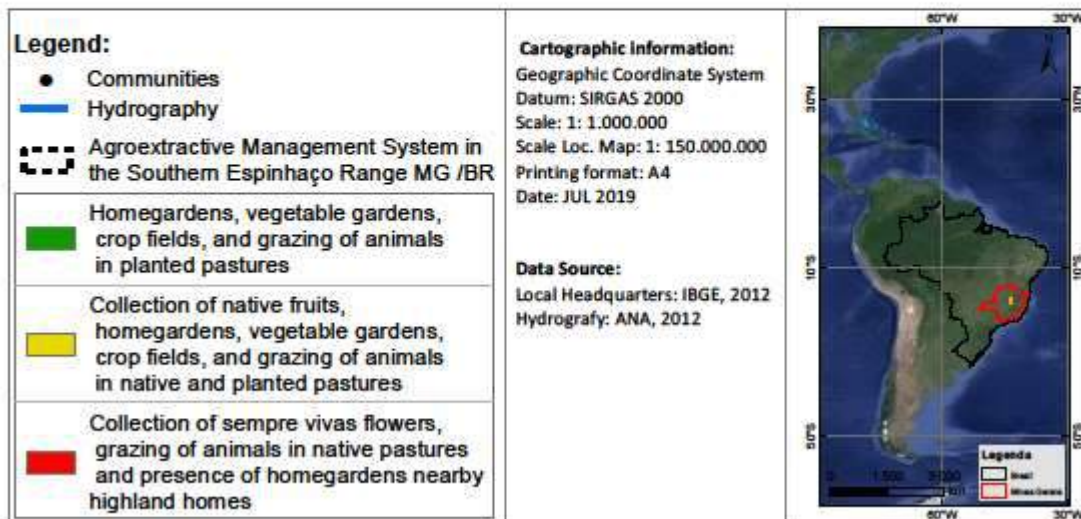
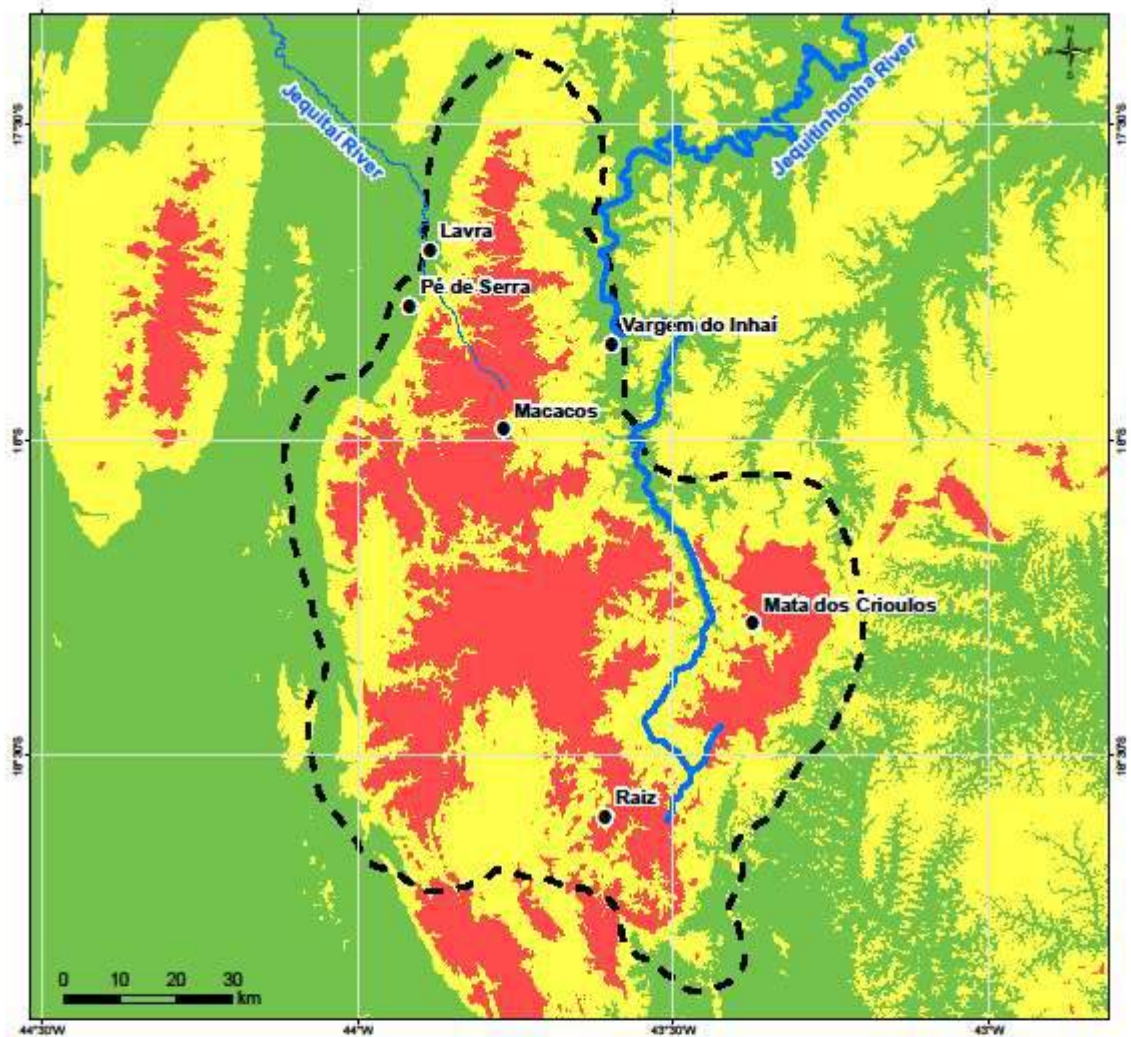


Figure 7 – Land use in a fragment the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (Brasil).

In the context of global climate change in recent decades, carbon dioxide emissions from fire have been condemned by society as a whole. The use of fire in the Traditional Agricultural System in the Southern Espinhaço Range (MG, Brazil) does clearly contribute to such emissions. However, there must be long-term monitoring of current practices, to assess whether these emissions are offset by the same system's high biomass production, which constantly sequesters carbon dioxide from the atmosphere. In addition, the use of fire is localized, small-scale and controlled.

On the other hand, a system of exceptions to this system is justified, since it is integrated with local ecosystem dynamics, retains high biological and genetic diversity of global importance, and guarantees a unique way of life in an exceptional landscape. This is why Brazilian legislation treats these specific ways of life with specialized legal regimes. It is significant that the flowers gatherers' agricultural heritage system is in a priority location for the conservation of the Brazilian savannah, not only in the planning of municipal, state and federal governments, but also inside nature conservation units run by the same three spheres of government, thus confirming the system's capacity to conserve a high degree of biodiversity, abundant water and the unique landscape managed there. It should also be noted that there would be considerably less biodiversity, for reasons already explained, without the traditional practices and knowledge in landscape management, adapted to the needs of social groups who have been present for centuries in this southern portion of the Espinhaço Range in Minas Gerais.

4. Cultures, value systems and social organizations

We have seen how the traditional agricultural system's food and rituals are part of the *sempre-vivas* flowers gatherers' culture and way of life. They are part of their cosmovision, memory, means of mobility and leisure (horses in particular), festivals (using cassava), religiosity (plants associated with the rites), food culture and traditional associated knowledge, all of which are part of an identity passed down through generations: "As long as I can remember, I've been a flower gatherer and that's my life."

The gathering of different parts of so many species of plants, in the community members' memory, goes back to ancestral practices in which "flower gathering" identifies them with this practice, evoking rhythms, rituals, meanings and stories:

I started gathering as a boy ... and now I'm 67. My mom gathered flowers, my grandma too; it goes way back. Then they started exporting, but people were already gathering. ... I remember, a long time ago, more about women and children gathering. Later it was everybody. The flower is very good; God gave it to help us and we must take care of it. No one can want everything just for themselves. (Sempre-vivas flowers gatherer, 67)

The species they gather come from different environments and are not a uniform continuum in a native field, despite what one might think. To find them, they must find “patches” of flowers in the fields. The gatherers are very agile in their work and have a vast knowledge of the fields, to go straight to places where they can find each type or species. In their understanding, each of these environments has its own classification along a complex range of criteria, from the sensorial perception of the elements that distinguish them to the traditional uses that are made and reworked over time, and associated meanings that make up rich, detailed symbolic systems.

The variations in relief, soils and vegetation cannot be taken in isolation, but as interacting features that express nuanced qualities in a scenic whole. Even subtle marks engraved by time, like those left by runoff water down a hillside, can contribute to the unity of a differentiated landscape. Together, the wholes weave a mosaic of possibilities and complementarities that interact, as a totality achieved through a combination of uses, conferring specific qualities that give rise to doing and living.²⁷

The sempre-vivas flowers gatherers thus make up a series of related local groups, in a structural continuity of small continuous and discontinuous territorial spaces. The System's participating communities – Lavra, Pé-de-Serra, Macacos, Raíz, Mata dos Crioulos and Vargem do Inhaí – share close kinship relations, analogous lifestyles, organizational principles, forms of socialization, with minor variations in some of their cultural forms, to use Leach's concept²⁸ that:

27 Ribeiro (2008) stresses that communities that take from the biome part of the resources they need for their own economic, social and cultural reproduction have a greater interest in conserving them than the socio-economic sectors that only see them as obstacles to their own business activities and profits. Plant extractivism must also be grounded in the knowledge of traditional communities about the biome, although in dialog and bringing in contributions from science, to help achieve environmental sustainability and economic and social viability. This requires a diversification of economic activities, not only to have less impact on specific species and environments, but to reduce hardships caused by market fluctuations from specializing in a limited number of products and services.

28 Based on the relations between the Kachin and Chan peoples, in Burma, Leach (1996) developed his theory on relations between culture and structure. For him, culture provides the “form,” the “clothing” of the present situation: the form of the situation is a given, a product and an accident of history; the structure of the situation, meanwhile, is quite independent of its cultural form. “The same kind of structural relationship can exist in

In any geographical area which lacks fundamental natural frontiers, he human beings in adjacent areas of the map are likely to have relations with one another – at least to some extent – no matter what their cultural attributes may be. To the extent that those relations are orderly, rather than entirely fortuitous, they contain an implicit social structure (1996: 79-80).

Evans-Pritchard (1993, 7-8) made nearly the same point when analyzing the system formed by the Nilota peoples, including the Nuer and Dinka and also the Atwots, the Jikany and the Shilluk speakers in general, recognizing their miscegenation, cultural loans and the possibility of defining a Nilota culture and social structure.

As for the *sempre-vivas* flowers gatherers, although flowers gathering is not all they do in the highland of mountains it is the *identity* that joins or brings together communities in different locations, as collective players/subjects. Almeida (2006) stressed that such identities do not signify or refer only to the occurrence of one or more plant species in an area or in “patches,” nor do they mean that this is their only traditional activity. Such identities refer to an identity expression that is translated through territorial areas of belonging. *Common use*, as a process of *territorialization*, provides tools to comprehend how territories to which people belong have been constructed politically, through actions of free access to the basic resources needed to reproduce social forms, in different regions and historical times.

Territorial identity also refers to a common historic and geographic experience, expressed in links between player and space (Heidrich, 2009), which appears in the relationship with the *Other*. It claims people’s rights that have historically been denied and seeks social legitimacy in maintaining their territory, with meanings and ways of life rooted in their ancestors, in “traditions” – which are constantly reworked and re-signified in the present – and in “culture,” that constitute the *community* they make up (CUNHA, 1985). The constitution of self-named identities presumes specific territorialities (ALMEIDA, 2006), such as the “*serra*” (mountains) and the “*apanhadores de flores*” (flowers gatherers). This collective self-naming expresses diverse intrinsic political-organizational forms that make up the *traditionally occupied lands*. They break with customary, homogenizing dichotomic

many different cultures and be symbolized in correspondingly different manners. Nor are there any intrinsic reasons for the significant frontiers of social systems to coincide with cultural frontiers” Leach, 1996: 79). Therefore, even where cultural differences are significant, the fact that two groups are from different cultures does not necessarily imply that they belong to different social systems.

views, and redraw civil society with social diversity (ALMEIDA, 2006). At the same time, the flowers are seen as a gift:

“God left the flowers for the people to have income. Many people have cared for their families with income from the flowers. They don’t grow without a hand from man.” (A young *sempre-vivas* flowers gatherer²⁹)

The land and the natural resources it contains, in this logic, have an intrinsic value, as described by Woortmann K. (1986: 03):

From this standpoint, land is not an object of labor, but the expression of morality; not in its externality as a factor of production, but as something thought and represented in the context of ethical values. Land is not seen as nature, on which a domestic group projects its labor, but as a family heritage, on which labor builds the family as value. As a heritage, or as a gift of God, land [and the natural resources it contains] is not simply a thing or a commodity.

This affirmation clearly establishes the triad of *God, Humans and Nature*, as a structure that permeates the *sempre-vivas* flowers gatherers’ entire universe, where land and the resources it contains are God’s. Each part of the triad is a component of tradition, the structure both structures and is structured by the group’s tradition, as opposed to conceptions and practices strictly focused on economic production.

"God" here should be understood as the "sacred of the group," whose perception and treatment vary according to ethnic-religious influences. In the communities of Macacos, Lavra and Pé-de-Serra there is a strong presence of popular catholicism with appropriation and reproduction of elements of catholicity in their own terms and modes. In the communities of Raíz and Mata dos Crioulos, conceptions and practices are instructed by popular catholicism and newly arrived evangelical religions (Protestant Christianity). Moreover, in these two and also in Vargem do Inhaí, where the african ancestry is more pronounced, there is the association of ritual practices of african tradition with conceptions and practices of popular catholicism such as *batuque*, the revelry of kings, the *novenas*, among other manifestations, that crossed the pressures suffered in the colonization process.

²⁹ Young, here, refers to persons from 18 to 30 years old.

As in all these communities, beliefs referenced in indigenous culture in “enchanted” beings that protect the waters and forests, among others, are present and denote the “sacred” as regulator of the use of such natural resources. Thus, waters and forests must be protected, otherwise it is contrary to the “sacred” that can respond with prolonged droughts leading to lack of water in the community or insufficient food harvest. The meaning of the land as "sacred" and "mother" also has direct implications for agricultural practices, such as not using industrial inputs that are thought to damage or make it unhealthy, which would also affect agricultural production negatively. That is, the "sacred" is worshiped in religious rituals and has a direct influence on agricultural production and therefore on the harvest. As well as food culture has intrinsic relationship with the food possibilities of the native vegetation and the agrobiodiversity of the system.

In this perspective, cultural manifestations, such as rites and rituals, parties, celebrations, dances, musicality and food culture, are referenced in the indigenous, european (mainly Portuguese) and african matrices. They are also marked by seasonal variations and the agricultural calendar experienced by successive generations of these communities. Family, community and crops are celebrated for the perpetuity and abundance of life. Such celebrations are generally associated with catholic deities and saints containing contents of the “sacred” referenced in indigenous and african matrices. Thus, many of the celebrations and festivities are related to the catholic religious calendar and most of the time is combined with playful aspects containing specific songs, dances and cuisines in which the "sacred" is founding.

Within the festivities there are, for example, in Vargem do Inhaí, the christmas ritual like the Pastorinhas with their songs, performances, dances and visits to the neighboring families where they celebrate a christmas. There are celebrations in the various communities of Santos Reis that begin at christmas celebrations (December) and end on January 6. During this period the people visit the homes of families, remembering the pilgrimage of the catholic kings, bringing music (performed on accordion, guitar, drums and tambourine), chants and performances that go back to christmas and are received with local food and drink. These festivities include the dances of “chula”, “umbigada”, “batuque”, “lundu” (these four of african origin) and the “farró”. It also dances “recortada”, “espinica”, “golden skirt”, “guiano” (among men) and dove wept (only with women).

It is noteworthy that in dealing with the religiosity of sempre-vivas flowers gatherers we are emphasizing the ethical implications of religion more than the religious universe itself, that is, the societal dimension of the religious phenomenon, the plane of social relations and

practices, more specifically religious prescriptions and rituals linked to land use and agricultural production. In this sense, there is a whole circuit of religious festivals, especially those dedicated to the “protective saints” of the communities, which are closely linked to the production and the agricultural calendar (flower and fruit gathering, diverse and abundant crops, animal husbandry, etc.). So, the productive calendar and the religious festivals/rituals institute the cohesion of the group, forbidding any omission to collective predictions, at the same time ensuring predictability outside the realm of science or economic calculation.

In this sense, in January these communities celebrate São Sebastian with the Folia de Reis in praise of this saint to: “ask for rain to ensure a good harvest”. This moment marks the good moment of planting, as the residents explained: “the flood of São Sebastian is the time to plant”. At this time religious celebrations, gift auctions, dances and typical food prepared by partygoers are offered to the whole community as an affirmation of abundance.

In June they celebrate Saint Anthony, Saint John and Saint Peter in their families' homes and communities. In general the partygoers, who organize the festivities each year, are those with the same name of these saints. The partygoers receive their families and neighbors with typical foods made with food harvested at the same year based on: corn, cassava and sweet potato. This is directly related to the celebration of the harvest each year. Bonfires are organized and around them stories of popular culture are talked. On this occasion the families meet and godparents say prayers blessing the children (godchildren).

In July, in Macacos, they celebrate the Sacred Heart with the whole community meeting in the "novenas" (group prayers) and religious celebrations, where the “mast” is raised in praise of the saint and there are festivities with bonfires, verse chants, typical foods and beverages such as “farofa”, rice, beans, meats, tubers “soaps” and fruit sweets from the region. In Raíz, the celebration of the Holy Supper also has native foods such as “embaúba” and “samambais” and in the Mata dos Crioulos the consumption of native plants such as “gondó” and “palmitinho” are present. In prays the request for a good harvest is present, as one resident explained: “In the novena we thanks for the harvest we had and asked for the next one. You have to plant with faith, first with God. If you plant without faith, you harvest nothing”.

Also in July in Lavras and Pé-de-Serra celebrate Santa Ana and in October celebrate Our Lady Aparecida. Another common practice at festivities and celebrations is “cavalgadas” (horse riding) between communities, present in religious rituals and recreation moments. In these celebrations they hold novenas from the religious calendar when they also of pray for the harvest, for the sanity of the crops and for rain to come in order to guarantee the next

harvest. Thus, the mediation between the agricultural cycle and the religious calendar is made by the expectation of rain and good harvest, elements that establish the mediation between the concrete plane of relations and the transcendent. Rain for them, as well as a good harvest (both from the fields and flower fields), are divine blessings and fertilize not only the land, providing a good production, but also social life itself.

In the communities involved there is collective involvement not only in the productive process itself, but also and above all in the propitiatory movements, constituting “novena” practices, penances and promises. Among the penances are the following: carry stone on the head until the cruise and continue praying, then depositing the stone at the feet of the cruise and wetting it for 09 days. In other words, devotion and saints festivities are also propitious rites linked to good rain and a good harvest. Some rituals are also used to prevent excessive rain (in flooding) such as break down termite mounds, put salt, cornmeal or soap on the roof.

There are also rituals of “rain divination”, with the use of salt stones to know in which months there will be rains and thus organize the planting. These rituals are articulated with the “penitential” rites, the first one corresponding to prediction and the last one to intervention. The two rituals are intertwined in time, each one demands the other, to attempt to change the course of nature, to make it less ruthless, through the mediation of the saints and the sensitization of God or the sacred of the group. The principles of reciprocity are clearly seen here, where pleasing the saint results in good flower collection, good crop harvesting, good animal husbandry.

Religiosity is also part of the protection rites. To protect the crops, for example, “benzeções” (blessings) are made. Amulets such as ox horns and protective plants such as guinea and São Jorge sword are also used to avoid bad energies and negative interference with the crops. There are people of reference for protection rites in the communities, knowledgeable of plants and roots that cure the ills and diseases of people and creations. To request protection for working in the fields to collect flowers and take care of animals, it is also customary to pray to Saint Benedict and carry garlic or “jilo” in the pocket. It is common practice to respect the lunar calendar for sowing, planting, fishing and harvesting.

Religiosity also establishes precepts of good coexistence and cooperation, establishing networks of solidarity in all productive activities, with the presence of joint efforts to build houses, cooperation in agricultural work, in flower collection and animal breeding, also highlighting the exchange of days, exchange of services and “surprise”, a joyful way in which those closest neighbors anticipate someone's need, performing the work of cleaning the crops, for example.

The survival ethic of families and communities has connection with the relationship of flower gatherers to each other, to the institutions around them, and to their notions of justice and equity. The moral principles that seem firmly rooted in the social pattern of the flowers gatherers are reciprocity and the right to survival. The first serves as a guideline to guide interpersonal conduct based on reciprocity; the second defines the minimum needs that must be satisfied by community members. There is a whole logic of access to resources based on these two principles (reciprocity and survival, more properly productive autonomy).

References to the use of common natural resources (land, water and biodiversity) have to do with common-law rights, with access regulators (kinship) and use (with the logic/form of sustainable use) that are known to and reaffirmed by the communities. A resident who ignores them may suffer criticisms and sanctions from (older) residents, as a social-control mechanism. This is aimed at maintaining the system's longevity, especially through caring for biodiversity, for landscapes managed with fire in the crop fields and native fields and for water. This involves several activities:

- care and rules in the gathering of flowers, ensuring the conservation of seeds and enriching native flowers fields;
- intensity and care in the gathering of medicinal plants, oils, fibers, wood and others;
- regulation of the density of cattle herds in native pasture fields, to avoid overgrazing in environments with flowers, even when the pastures used by cattle are not the ones where flowers are gathered;
- care in the use of controlled fire for managing the crop fields and native fields;
- knowledge and care for the fauna and its functions in keeping the whole system alive.

That knowledge and the communities' political-economic organization are the basis for building mechanisms to regulate the use of natural resources (coverage, intensity of gathering, conservation of water and forest resources, etc.), mechanisms involving territorialities, kinship, needs, consumption and access to renewable natural resources, as well as social organization, through political organization, to keep the system alive, demanding specific public policies from authorities at different levels, politicizing a territorial identity that expresses ancestral identity links to the place of life.

The communities also enjoy a unique way of life with codes for the appropriation and use of the land and its resources, for community management over those resources, a regime for common-use lands, reciprocity and a cosmivision that make possible the way they

make, create and live. This, along with the organization of their economic life and social-cultural reproduction proportionate to the availability of resources, needs and natural cycles for their renovation through *transhumance*.

This way of life was able to develop a complex agricultural system, in which the use of *lowlands* and *highlands*, *horizontalities* and *verticalities*, conserves diversities and treasures. Transhumance is thus a cultural practice that allows them to use all the ecosystemic potential contained in these environments, to enable life in the face of adversity. The knowledge passed down through generations is also vital for the traditional management of all the species and natural cycles involved in the process.

Transhumance, biodiversity and the *sempre-vivas* flowers gatherers' culture thus all come together to constitute the commons and the groups' sense of belonging. Paul Little stressed factors such as "the existence of common property regimes, the sense of belonging to a place, the pursuit of cultural autonomy and sustainable adaptive practices that the various social groups studied now display" (LITTLE, 2002, p. 23), which can be observed in the relationships and way of life in the Lavra, Pé-de-Serra, Macacos, Raíz, Mata dos Crioulos and Vargem do Inhaí communities.

We must also stress the communal sense of this reverence, using the category "encompassing" that, for Dumont (1992), would be a moral individual who, as the group's representative, contains it in himself. The *sense of community* is made explicit by the holistic character of reality, with emphasis on the diacritics or elements more representative of the social universe. In contrast to our individualizing model of persons, things and knowledge, here local encompasses all domains of social life – kinship, production, politics, etc. – in a totalizing perspective (DUMONT, 1985; DURKHEIM, 1996).

In other words, there is no need to dissociate between the celebratory or propitiatory moments of the groups described here, marked by intense sociability and other spheres of social life, either the productive itself, or the political or even economic dimension. And many of the festivities are directly or indirectly linked to production (crops, flower collection, animal husbandry). Even moral precepts such as the obligation of godparents to their godchildren are fulfilled with the involvement of elements from the sphere of production. At the baptism rite, godparents usually present their godchildren with a calf, or a sow, or a chicken, usually female, to surrender and constitute a kind of savings for the godson.

The communities analyzed here are also bearers of a certain degree of *peasantry*, as seen for example in the relative autonomy of their collectivity *vis-à-vis* surrounding society, in the importance of the domestic group in organizing economic and social life, in the

relatively autarkic nature of their economic system, their forms of sociability and inter-knowledge, the solidarity and cooperation regime among families and local groups, the decisive role of leaders, the emphasis on production for consumption rather than reinvestment, the regime of succession and maintenance of family/community heritage, among others, as assumptions underlying this *way of life* (MENDRAS, 1978; WOLF, 2003; HEREDIA & GARCIA, 1971; SEYFERTH, 1985; WOORTMANN E., 1995).

One fundamental aspect in this process is social organization. The *sempre-vivas* flowers gathering communities are organized in community associations, where decisions are taken by majority votes and collective interests and rights override individual interests and rights. In addition, the *sempre-vivas* flowers gatherers are organized in a commission – the Commission to Defend the Rights of *Sempre-Viva* Flowers Gatherers' Communities (CODECEX) – coordinated by representatives from all the participating communities, with bimonthly meetings to take collective decisions. The majority of the Commission is made up of women, and there are many young people. They also hold training activities and surveys for decision-making in the communities. They partner with researchers at federal universities and have national and international partners with whom they meet at least twice a year, in addition to carrying out activities and research with their partners to enhance the sustainable management of their heritage agricultural system.

Through the CODECEX, *sempre-vivas* flowers gatherers have a seat on the State Commission of Traditional Peoples and Communities, on the State *Pro-Pequi* Commission (focused on plant extractivism) and on the National Council of Traditional Peoples and Communities, all of them official bodies with parity representation of governments and civil society, where decisions are discussed and made on public policies for traditional agricultural systems and territories. In the civil-society sphere, the CODECEX also participates in the Northern Minas Rosalino Coordination of Traditional Peoples and Communities, the Minas Gerais Semiarid Agrobiodiversity Network, the State Coordination of Rural Women and the Minas Agroecology Coordination.

5. Landscapes Features

The Southern Espinhaço Range was formed in the Orogen designated by the same name, in the mean Proterozoic (about 1250 Ma). In geological terms, the fundamental feature of the southern portion of the Espinhaço is the predominance of quartzites that, throughout the compartment, make up a rigid, yet densely fractured and sheared cover. The forms of relief

resulting from this sculpturing by fluvial dissection are mostly ridges, escarpments and deep valleys. However, in the midst of this dissected plateau, there are depressed areas with remnants of a previous summit surface and manifestations of several other rocks such as granitoids, metasedimentary and metavolcanic rocks, supporting more or less smoothed polyconvex collinear morphologies. (SAADI, 1995).

This portion of the Espinhaço Range, in which the *sempre-vivas* flowers gatherers' agro-environments developed, can be classified into three macro-units: a) *In the Mountains*, b) *Hillsides* and c) *Lowlands* (Figure 4).

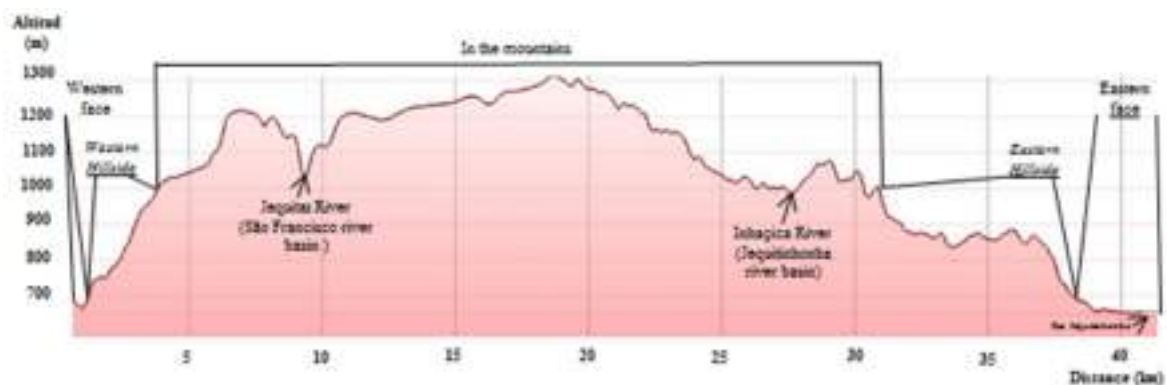


Figure 8 – Morphological profile of the Southern Espinhaço Range from the Pé da Serra community to the Vargem do Inhaí community.

Sobre a Serra – In the Mountains

In the Mountains, with the areas at elevations above 1,000 m, we find the *campos* (grasslands) where *sempre-vivas* flowers are gathered and large animal herds graze in common-use areas. These native fields have diverse features and phytophysiognomies, which we describe here.

a.1) Campo Rupestre – Rupestrian Grasslands³⁰

The *campo rupestre* are fields with bushy and shrub vegetation. They have this name because they are always associated with rock fragments and rocky outcrops, in this case, quartzite outcrops. They occur in areas of irregular relief and steep slopes with the presence of dystrophic and very shallow sandy soils. *Campo rupestre* associated with rocky outcrops cover more than 50% of the *Mountains* (ARAÚJO, 2015). In these areas, *sempre-vivas*

³⁰ Conceição, Abel A. ; Rapini, Alessandro ; do Carmo, Flávio F. ; Brito, Juliana C. ; Silva, Gabriela A. ; Neves, Sâmia P. S. ; Jacobi, Claudia M. . Rupestrian Grassland Vegetation, Diversity, and Origin. *Ecology and Conservation of Mountaintop grasslands in Brazil*. 1ed.: Springer International Publishing, 2016, p. 105-127.

flowers species are rare and, due to the relief and plant species that predominate there, they are also unfavorable for grazing large animals. In this environment, sempre-vivas flowers gatherers collect a few species such as arnica (*Lychnophora* sp.), used as a medicinal plant, and “*lapa okra*” (*Pilosocereus* sp.), a food. Being well conserved, these areas play an important role in protecting wildlife and recharging aquifers.

a.2) *Campo Aberto* - Open grasslands³¹

The *campos abertos* (open grasslands, also known as clean grasslands) are made up of herbaceous vegetation in areas that may be well drained or poorly drained (swamps). They are present in flatter and dug-out parts of the *Mountains* formed by the deposition of sediments transported from higher surrounding areas. The well-drained *campos abertos* have deeper sandy soils (up to 2 m), associated with sandy soils with dark subsurface layers. The swampy fields, due to the deposit and accumulation of organic material in anaerobic conditions, have dark and muddy soils, entirely dystrophic. In the *campo aberto* we find nearly all the sempre-vivas species, including the buds, gathered by the sempre-vivas flowers gatherers. There are also grassy species that are grazed by large animals.

a.3) *Campo Sujo and Campo Cerrado* – Dirty grassland and Cerrado grassland³²

The *campo sujo* (dirty grassland) and *campo cerrado* (Cerrado grassland) phytophysionomies are both characterized by herbaceous vegetation, with the presence of shrub species in the *campo sujo* and tree species in the *campo cerrado*. They are found in flat or low slope areas contiguous to *campos rupestres* and/or *campos abertos*, and quartzite outcrops may be present between them. These areas have mostly shallow or slightly deeper sandy soils, which are always dystrophic.

Scattered throughout the *campos abertos*, or inside the *campo sujo* and *campo cerrado*, are several shrub and tree species, from which ornamental products are extracted to be marketed and fruits are collected for consumption *in natura*. The *campo sujo* and *campo cerrado* areas, nearby the *campos abertos*, are places where sempre-vivas flowers gatherers take large animals to graze, due to the occurrence of herbaceous and shrubby species they can eat. They are generally managed as common-use land. The *campo sujo* and *campo cerrado* agro-environments, as well as the *campos abertos*, are used by families who spend lengthy

³¹ Paulo S. Oliveira and Robert J. Marquis. *The Cerrados of Brazil: Ecology and Natural History of a Neotropical Savanna*, 2002.

³² Paulo S. Oliveira and Robert J. Marquis. *The Cerrados of Brazil: Ecology and Natural History of a Neotropical Savanna*, 2002.

periods *In the Mountains* to gather flowers, and where they also cultivate homegardens, mainly in areas with richer organic soils and/or located near waterways.

a.4) *Capão de mata* - Thicket of trees

The designation *capão de mata* (thicket of trees) refers locally to places where forests occur on hydromorphic areas, known in the specialized literature as Paludal Forests. They occur in depressions *In the Mountains*, often in small circular or elongated patches in the headwaters of valleys, and may be contiguous with open wetlands. Soils in the *capão de mata* are dystrophic, dark and muddy (greater accumulation of organic matter). *Capão de mata* areas are protected by sempre-vivas flowers gatherers, as refuges for wild fauna and also because they contain the majority of the high *mountain* springs and waterways. When it is time to burn the fields, firebreaks are used to protect *capões de mata* and preserve the water they produce.

a.5) *Floresta Altimontana* – Mesophytic semideciduous forest³³

The *floresta altimontana* (Mesophytic semideciduous forest) has vegetation with tree species located in *valleys* that cut the quartzite structures along the waterways in situations where non-consolidated sediments were able to accumulate, giving rise to sandy or clayey/sandy soils, when formed on remnants of previous clayey topsoil or on metapelitic rocks. The *floresta altimontana* located in eastern portions of the *mountains*, due to their proximity to the Atlantic Forest biome, have larger trees. Agro-environments in *floresta altimontana*, as well as the *capões de mata*, are protected by sempre-vivas flowers gatherers due to their importance for wildlife and to conserve springs and waterways.

³³ Paulo S. Oliveira and Robert J. Marquis. *The Cerrados of Brazil: Ecology and Natural History of a Neotropical Savanna*, 2002.



Photo 31: *Campos rupestres* (rupestrian grasslands) with *campos limpos* (open grassland) between them and forest in the background.



Photo 32: *Campos abertos* (open grasslands) with *capão de mata* (thicket).



Photo 33: *Campo sujo* (Dirty grassland).



Photo 34: *Campo cerrado* (Cerrado grassland).

Encostas da Serra – Mountain hillsides

The *Encostas* (hillsides) or "way up the mountain," as they are known by *semprevivas* flowers gatherers, situated between the *Mountains* and *Lowlands*, between approximately 1,000 and 700 m elevation, are steeper on the western face of the mountain range and less steep on the east side. In the words of Saadi (1995), the escarpment that forms the western border presents a regular trajectory, as a rule, supported by packages of quartzites, at least at the top. The other escarpment on the eastern border does not present the same regularity, nor the continuity observed in the west. The general layout forms a concave region facing east (Figure 2). On the *hillsides*, quartz outcrops associated with *rupestrian grasslands* prevail, as described for the *Upper Serra*. In the structural valleys and in the discontinuities of the escarpment (steps), meanwhile, sediment packets have formed slightly deeper soils, building up areas of Forest and Cerrado.

b.1) *Forests* - Mesophytic Semideciduous Forest

Forests occur in the less steep *hillsides*, deep in the valleys and near the waterways, but are most frequent above 800 m elevation. Their Mesophytic Semideciduous Forest phytophysionomies occur on both sides of the mountains, but with some differentiations.

The eastern face of the *hillside* is less steep, presenting less pronounced slopes and more open valleys, which the locals call grottos (*grotas*). This area is also in a more direct transition to the Atlantic Forest biome and is more influenced by moist winds rising from the Atlantic. At the bottom of valleys (*grotas*) are soils that, although sandy, are a little deeper and have accumulated more organic matter, which the locals call “*morciça*” soil. Where they have received contributions from remnants of earlier clayey topsoil or metapelitic rocks, the clay in the grotto soils goes a little deeper. Although dystrophic, these soils contain more available nutrients than others in the area, leading to the formation of denser forests with larger trees, known by the residents as "thick woods" (“*mata de pau grosso*”).

Mostly contiguous to the "thick woods," more open forests with smaller trees occur in slightly steeper areas that may have no accumulation of organic material in the soil, known as "bad-soil woods" (“*mata de terra ruim*”). In these areas, the soil may have been formed from remnants of prehistoric clayey topsoil or metapelite rocks, containing a little more clay, with red or yellow colors, and called “*massapé*”. The low density and height of trees in the "bad-soil woods" reflects the dystrophy of these soils.

The western face of the *hillside* is steeper, with more declivities, where structural dissection has caused the formation of deeper, narrower valleys, called *boqueirões* by local residents. Forests are present in all *boqueirões*, varying in density and size of the trees, depending on the characteristics of the soils where they stand. They are denser and taller in some situations, where sediments of previous clayey topsoil have allowed the formation of slightly deeper soil with a greater capacity to retain water. They are more open, with shorter trees, where the soils are shallower or contain less clay. There are also forests on shallower soils formed from metapelitic rocks, or on slightly deeper and well drained soils, where the greater aridity on this face of the *hillside* causes a total loss of leaves in the dry season. These areas present Mesophytic Deciduous Forests phytophysionomies.

The forests are agro-environments where *sempre-vivas* flowers gatherers set up their homegardens, crop fields and planted pastures in areas they call “plant lands” or “culture lands.” This preference is explained by the higher content of organic matter, nutrients and moisture in the soils. In some cases, families’ houses are also located in these areas.

b.2) *Cerrados* - Savannahs³⁴

The *campo sujo* and *campo cerrado* phytophysionomies are present on both faces of the *hillside*, with features similar to those we have seen in the *Upper Serra*, but here on steeper slopes and gravelly soil, i.e., with the presence of small rock fragments (gravel) on the surface. They are called “*carrasco*”, a name also used at times for intermediary situations between *campo cerrado*, *stricto cerrado* and forest (*mata*) in which the plant growth is thin, with small trees on gravelly ground.

The *Stricto Cerrado* phytophysionomy, consisting of herbaceous, shrub and arboreal small and medium-sized vegetation, is found in stretches of the *hillside* flattened by the deposition of sediments or on slopes located in the middle and lower thirds (below 900 m elevation), on somewhat deeper sandy soils called "trays" (“*tabuleiros*”). In some cases, on the western face, they are found on more clayey soils formed from prehistoric clayey topsoil or metapelitic rocks, in all cases dystrophic.

In the *cerrado* areas, *sempre-vivas* flowers gatherers collect edible fruits (*pequi*, *panã*, *mangaba*, etc.) and several other products for ornamentation and medicinal uses (*catuaba*, *nata danta*, *pacari*, etc.), as well as wood for firewood and construction. In the *cerrado*, there large animals are also grazed, taking advantage of herbaceous and shrub species that provide forage. These areas are also agro-environments where *sempre-vivas* flowers gatherers set up homegardens, vegetable gardens, crop fields and planted pastures.



Photo 35: Forest on the west face.



Photo 36: Forest on the east side.

³⁴ Paulo S. Oliveira and Robert J. Marquis. *The Cerrados of Brazil: Ecology and Natural History of a Neotropical Savanna*, 2002.



Photo 37: Stricto Cerrado on the west side.



Photo 38: Stricto Cerrado on the east side.

The “Sertão” and the Jequitinhonha River Valley - Lowlands

The *Lowlands* are plains originating from colluvium and alluvium sedimentation along the waterways, located below 700 m elevation. On the eastern side of the mountains, they form a continuum with the Jequitinhonha River’s depositional plain, which evergreen flowers gatherers call the "shores of the Jequitinhonha." On the western side lies the transition from what the community calls "*serra*" to the "*sertão*". On both the eastern and western sides, two situations are identified: the *Baixada* ou *Baixa* (lowlands) and the *Vazante* or *Vargem*. The *Vazante* can be either *dry* or *humid*. Some differentiations occur between these environments, whether on the eastern or western sides of the mountain range, as we shall see.

c.1) *Baixada* - Lowland

The *baixadas*, or *baixas* (lowlands), as they are known in the communities, are the highest areas in the *lowlands*. They are generally formed by the colluvial sediments of the *hillsides*, with somewhat deeper sandy soils – at least 2 m or, if there are sediments from metapelitic rocks, soils with a little more deep-lying clay. On the western side of the mountains, the *lowlands* are located in between the quartzite geological unit of the Espinhaço Supergroup and the pelagic carbonic unit of the Bambuí Group (SAADI, 1995). The *lowlands* formed by finer colluvium sediments therefore give rise to red or yellow clay soils which, although dystrophic, provide more available nutrients.

c.2) *Vazante* – Natural drainage areas near the river beds

Natural drainage areas near the river beds areas (*vazantes*) or meadows (*vargens*), formed by alluvial deposits with contributions of colluvial deposits, are the lowest areas, near the waterways. They may flood when the waterways overflow and be known locally as wet

meadows (*vargens úmidas*) or swamps (*brejos*), or else not flood and be called dry meadows (*vargens secas*).

The wet meadows have dark, muddy soils (greater accumulation of organic matter) while the dry meadows are sandier. On the western side of the mountains, the *vazante* areas near the “*sertão*” receive deposits of finer sediments, and the soil is more clayey. On the eastern side of the mountain range (Jequitinhonha “shores”), the meadows are larger, with more shifting between flooded and non-flooded areas, depending on the fluctuations of the Jequitinhonha River bed.

The original vegetation of the *Lowlands (Partes Baixas)* are stricto cerrado phytophysiognomies in transition to Mesophytic Seasonal Forest phytophysiognomies, on the eastern side (transition to the Atlantic Forest biome), and Mesophytic Seasonal Forest on the western side (*Dry Forests* on soils made up of carbonate rocks from the Bambuí Group). The *lowlands* are the areas with the greatest accumulation of organic matter, nutrients and soil moisture in the Traditional Agricultural System in the Southern Espinhaço Range (MG, Brazil). This has led them to be intensively used for homegardens, crop fields and planted pastures, in some cases.



Photo 39: Lowland pasture planted in Stricto Cerrado area.



Photo 40: Homegardens in damp and dry drainage areas near the river beds.



Photo 41: Garden in dry drainage area near the river beds.



Photo 42: Crop field in dry drainage area near the river beds.

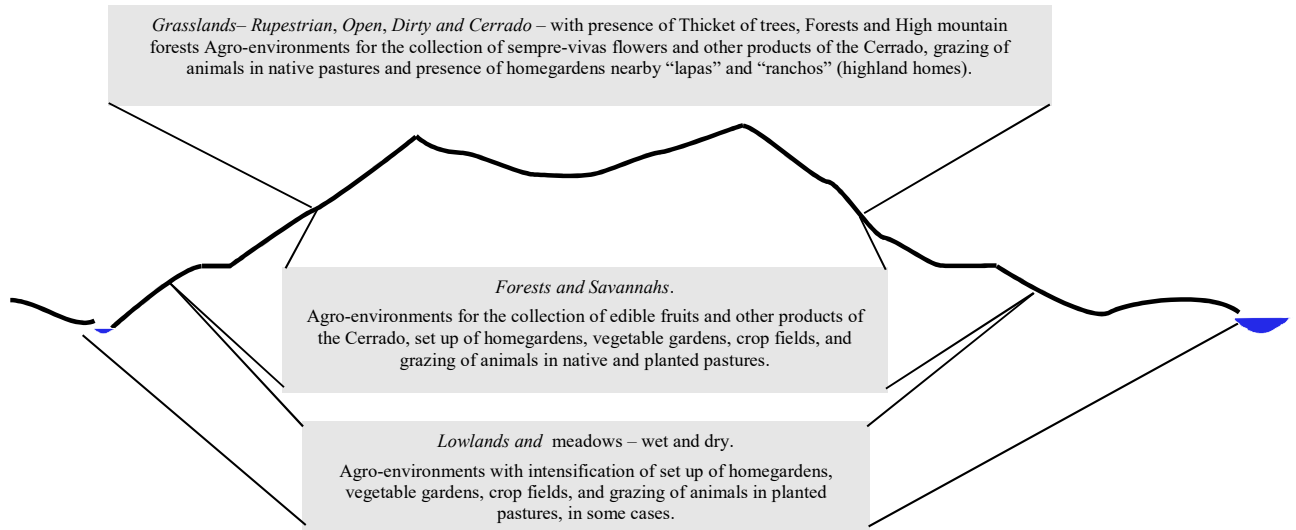


Figure 9 – Schematic profile with the location of the agro-environments of the Traditional Agricultural System in the Southern Espinhaço Range, MG, Brazil

The Traditional Agricultural System of sempre-vivas flowers gatherers communities runs through and composes all the described agroenvironments, from the highest parts of the mountain where the flowers collection fields are located, to the lower parts near the watercourses, where the more intensive crops with vegetable gardens and backyards are. The different managements and uses given to each agroenvironment intersect and interconnect them in time and space.

In the lower parts, where soils are wetter and have more nutrients available, the cultivation of gardens, small crops and breeding of small animals occur all the year supplying food (meat, vegetables, fruits, condiments and medicinal herbs) mainly for household food. Continuing with the lower parts and rising up the slopes, there is also the presence of vegetable gardens, backyards, and small animal breeding, however, these are the areas with the largest presence of the crops, these being predominantly “roças de toco” (slash-and-burn) - where the cutting and burning, followed by cultivation and then fallow for regeneration of native vegetation (forest or cerrado). In these agroenvironments, the observed landscapes constitute a mosaic with different stages of the “roças de toco”, that is, there are recently opened areas where cutting and burning took place, interspersed with areas with different times of use and areas where the native vegetation is in regeneration. In these environments are also found some portions of pastures planted for breeding large animals (cattle and horses) during the rainy season. So, we have a landscape that changes from one year to the other.

Although the uses and management of these agroenvironments occur throughout the year, they are most intensified during the rainy season (from October to April). From these agroenvironments, priority is given to food for families, but it is from them that most food products are sold.

In the highest parts of the mountain is collected different species of ornamental plants, fruits of the cerrado, medicinal herbs, wood for buildings, dry branches of the trees for cooking, and grazing large animals (cattle and horses) in native pastures. These environments are used and managed throughout the year, however, there is a concentration of flowers collection in some months of the year (January to May) and grazing of animals mainly in the dry season when the upper parts remain wetter. These environments provide, therefore, the highest income-earning household products (flowers and other cerrado products that are traded), foods (fruits of the cerrado) and medicinal herbs, as well as those that allow the savings (cattle) and the traction force (horses) of the families. In these areas there is also the use of fire observing humidity, plant vegetative cycle and wind direction, for pasture regeneration and stimulation of some *sempre-vivas* flowers species. So, it is a kind of slash-and-burn also and the landscape changes from one year to the other as a mosaic with different stages of the regeneration of native vegetation.

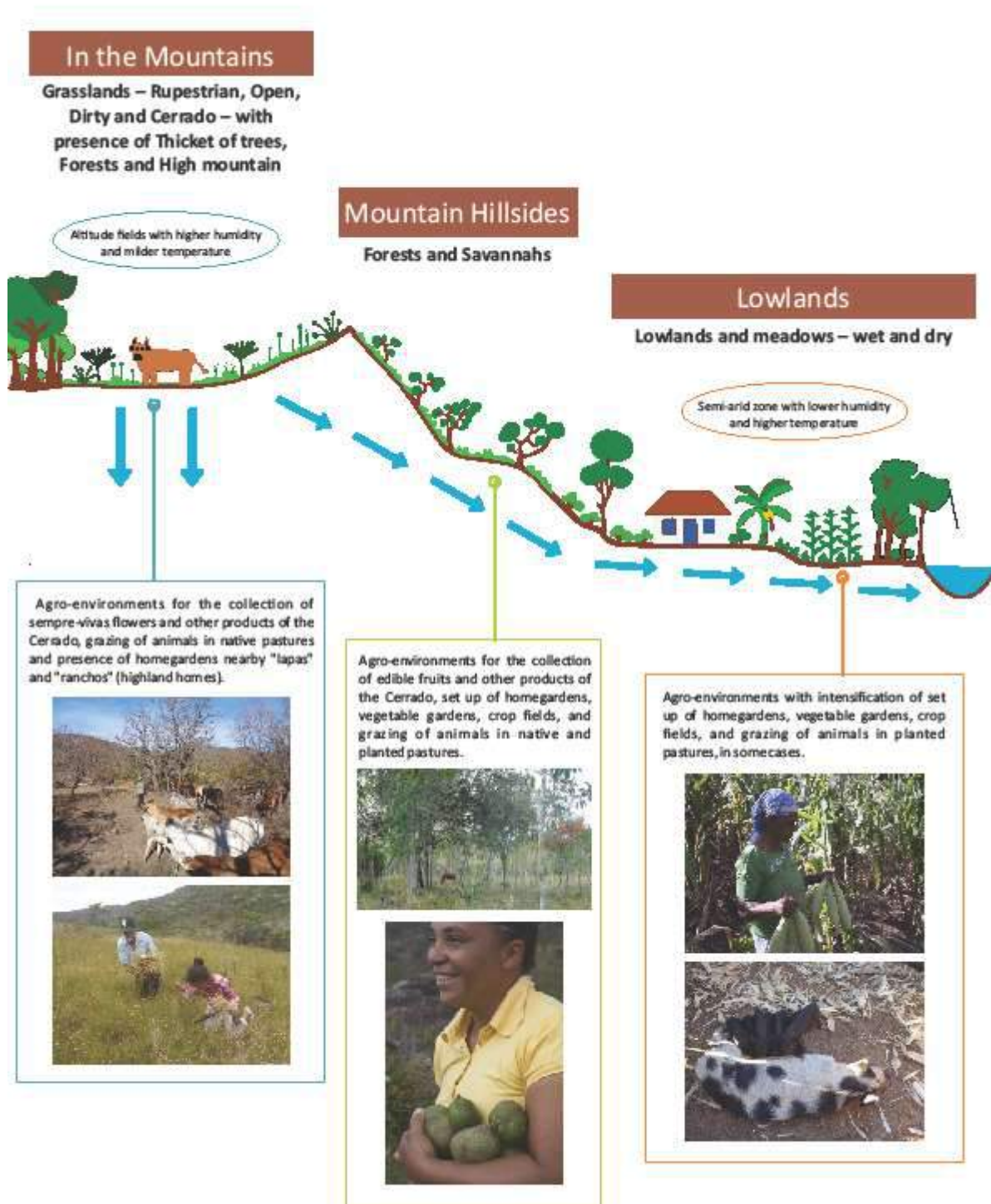


Figure 10 - Mountain profile scheme with the different layers of the Traditional Agricultural System in the Southern Espinhaço Range, MG, Brazil

From the lowlands to the highlands there are areas that are conserved with native vegetation, especially the more sloping areas and along the waterways that constitute a refuge for wildlife and protection/reservoir of waters to the springs and watercourses and constitute the rich drainage net observed. In this direction, the major part of these agroenvironments are managed with controlled fire used for biomass cycling - vital to increasing biodiversity through restarting the successional stages and increasing fertility of the soil (naturally sandy, shallow and dystrophic).

Therefore, the diversity of plant and animal species, adapted to local edaphoclimatic conditions, associated with traditional knowledge about agroenvironments with the central point of management the controlled use of fire, is what allows the agricultural production and therefore the life of these communities. As a result, there is a unique landscape, the result of the relationship between these human groups and nature in the production of life in which fire is the key to energy flows and cycling of matter in the system.

Thus, the integration and interconnection in the use and management of all the agroenvironments that make up the landscape in this portion of the Southern Espinhaço Range enable the constitution and continuity of the traditional agricultural system of *semprevivas* flowers gatherers with the conservation and maintenance of the rich and diversified agricultural heritage that can be conserved for future generations and for the whole society.

Conclusions

Over the centuries, generations of peasants, indigenous people and *quilombolas* have developed agro-food strategies that have resulted in complex, diversified agricultural systems adapted to local conditions. Such systems evolved from the *co-adaptation* of the needs and aspirations of human groups, such as rural communities, with their environment, leading to a wealth of *biodiversity, food and traditional knowledge* that allow the maintenance and conservation of natural resources in a variety of landscapes. This is why we find such diverse *agri-cultures* in the Brazilian countryside, for example. These living systems seek, on a daily basis, to co-adapt in the interaction between these rural groups/communities and their territories, considering the *agro-environments* contained therein, with their potentialities and limitations, and the contingent sociocultural, political and economic conditions. These system's *socio-ecological resilience* – developed and adapted to face variability and climate change, natural hazards, new technologies and adverse social and political contexts – is important to ensure *food sovereignty* and the maintenance of *traditional ways of life*.

The Traditional Agricultural System in the Southern Espinhaço Range (MG, Brazil), as detailed in this proposal, enables the conservation of a biome relevant to Brazil and the world not only for its biodiversity, but also for its water resources and climate regulation; its genetic resources adapted to adversities, essential for food production in the extreme conditions of the semiarid and in the context of climatic changes affecting the entire planet; the conservation of rare endemic species and the domestication of food species; vast knowledge associated with the agricultural and biocultural heritage, offering approaches to produce food more sustainably, considering environmental, socio-cultural, economic and political dimensions that value the shared management of the commons, so essential to life.

The *Southern Espinhaço Range* is thus a wellspring of water, agrobiodiversity and traditional knowledge associated with this unique *agri-culture* in an exceptional *landscape*, which constitutes an extraordinary *agricultural heritage*, with a differentiated role for Brazilian and global contexts, given its current socio-ecological function and its historic and future importance in the middle of the harshly devastated Brazilian savannah.

This system has been challenged by climatic and economic strains. The situation demands strategic efforts by both governmental and non-governmental agents, as well as research and development, in synergy with the strength and social organization of *semprevivas* flowers gatherers' communities, to ensure the system's long-term survival and, thereby, of their traditional way of life. This will be the focus of the following items, showing the proposal's alignment with international frameworks and the UN's Sustainable Development Objectives for global action, through our Dynamic Conservation Plan.

III. Action Plan for the Proposed GIAHS Site

DYNAMIC CONSERVATION ACTION PLAN FOR THE TRADITIONAL AGRICULTURAL SYSTEM IN THE SOUTHERN ESPINHAÇO RANGE, MINAS GERAIS (BR)



Minas Gerais, Brasil

December, 2019

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Abbreviations

ATER – Assistência Técnica e Extensão Rural (Technical Assistance and Rural Extension)

CAA-NM – Centro de Agricultura Alternativa do Norte de Minas (Northern Minas Alternative Agriculture Center)

CEPCT - Comissão Estadual para o Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais (State Commission for the Sustainable Development of Traditional Peoples and Communities)

CNPCT - Conselho Nacional dos Povos e Comunidades Tradicionais (National Council of Traditional Peoples and Communities)

CODECEX - Comissão em Defesa dos Direitos das Comunidades Extrativistas (Commission to Defend the Rights of Extractive Communities)

CU – Conservation Unit

DCP – Dynamic Conservation Plan

EMATER – Empresa de Assistência Técnica e Extensão Rural (Technical Assistance and Rural Extension Corporation)

ICMBio - Instituto Chico Mendes de Conservação da Biodiversidade (Chico Mendes Biodiversity Conservation Institute)

IEF - Instituto Estadual de Florestas (State Forestry Institute)

IEPHA/Minas Gerais – Instituto Estadual do Patrimônio Histórico e Artístico de Minas Gerais (State Institute for the Historical and Artistic Heritage of Minas Gerais)

ILO – International Labor Organization

INCRA – Instituto Nacional de Colonização e Reforma Agrária (National Institute for Settlements and Agrarian Reform)

IPHAN - Instituto do Patrimônio Histórico e Artístico Nacional (National Institute for Historical and Artistic Heritage)

PAA – Programa de Aquisição de Alimentos da Agricultura Familiar (Family Farming Food Procurement Program)

PNAE - Programa Nacional de Alimentação Escolar (National School Meals Program)

RTID - Relatório Técnico de Identificação e Delimitação (Technical Identification and Delimitation Report)

SDG – Sustainable Development Goals

SECCRI - Secretaria de Estado de Casa Civil e Relações Institucionais (Minas Gerais State Chief of Staff and Institutional Relations Office)

SECTUR - Municipal Secretariat of Cultura, Turismo e Patrimônio de Diamantina (Diamantina Municipal Secretariat for Culture, Tourism and Heritage.

SEDA – Secretaria de Estado de Desenvolvimento Agrário de Minas Gerais (Minas Gerais State Secretariat for Agrarian Development)

SEDPAC - Secretaria de Estado de Direitos Humanos, Participação Social e Cidadania (Minas Gerais State Secretariat for Human Rights, Social Participation and Citizenship)

SEE – Secretaria de Estado de Educação de Minas Gerais (Minas Gerais State Secretariat of Education)

SEGOV – Secretaria de Estado de Governo de Minas Gerais (State Secretariat of the Government of Minas Gerais)

SEEDIF – Secretaria Extraordinária de Desenvolvimento Integrado e Fóruns Regionais (Extraordinary Secretariat for Integrated Development and Regional Fora)

SEMAD – Secretaria Estadual de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais (Minas Gerais State Secretariat for the Environment and Sustainable Development)

SETUR - Secretaria de Estado de Turismo de Minas Gerais (Minas Gerais State Secretariat for Tourism)

UEMG – Universidade do Estado de Minas Gerais (Minas Gerais State University)

UFJF – Universidade Federal de Juiz de Fora (Juiz de Fora Federal University)

UFMG – Universidade Federal de Minas Gerais (Minas Gerais Federal University)

UFVJM - Universidade Federal dos Vales do Jequitinhonha e Mucuri (Federal University of the Jequitinhonha and Mucuri Valleys)

USP - Universidade de São Paulo (University of São Paulo)

1. INTRODUCTION

This Action Plan presents proposals for the dynamic conservation of the Traditional Agricultural System in the Southern Espinhaço Range, in Minas Gerais, Brazil. It was drafted by a participatory process coordinated by the Commission to Defend the Rights of Sempre-viva Flowers Gatherers' Communities (Codecex), involving approximately 200 people, through the following stages:

- **Expanded meeting of the Codecex Coordination:** In January 2018, representatives of the sempre-vivas flowers gatherers communities and members of the Codecex Coordination met to design a methodology to draft the plan and systematize the main challenges and threats for the conservation of the agricultural heritage system.
- **Community workshops:** In February and March 2018, Codecex held community workshops to discuss with communities the main challenges, threats and demands for the protection and dynamic conservation of their agricultural heritage system.
- **Regional gathering of flowers gatherers and partners** (March 16-17, 2018): the proposals presented at the community workshops were systematized and discussed at the Regional Gathering, with representatives of local communities, researchers and non-governmental organizations that collaborate with Codecex. The outcome of that gathering gave the main lines of action to be covered in the Dynamic Conservation Plan.
- **Regional gathering with representatives of government agencies** (April 12-13, 2018): This gathering brought together representatives from local communities, the Municipal Governments of Diamantina, Buenópolis and Presidente Kubitschek and Minas Gerais State government agencies. The representatives of official agencies helped detail the actions, proposing areas for partnership to implement the plan.
- **Working meeting to review the preliminary version of the Action Plan** (May 14, 2018): The results of the previous stages were included in the preliminary Action Plan, which was presented to be reviewed by representatives of communities, municipal and state agencies, researchers and partner organizations at a meeting organized by the Codecex. Suggestions from the participants were incorporated into the final version of the plan.

This Action Plan is therefore the outcome of a collaborative process involving local communities, the Codecex, researchers, partner NGOs and representatives of the Municipal

Governments of Diamantina, Buenópolis and Presidente Kubitschek and Minas Gerais State government agencies.

We first present the objectives, scope and main orientations of the plan, and then describe each strategic focus, including an introduction highlighting the main threats, challenges and opportunities, followed by the lines of action, the respective activities and all the partnerships involved in implementing the proposed actions. The final part of the document has a timetable for execution, the estimated budget, the fund-raising strategy and the management system for the Dynamic Conservation Plan (DCP).

The main threats to the Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais (BR) involve the spread of corporate agriculture with its monocropping systems and genetically modified (transgenic) varieties, mining projects, illegal access to traditional knowledge associated with biodiversity, privatization of water and events related to environmental compensations (such as fully protected conservation units overlying common-use lands). Other aspects that challenge the system include: climate change underway with impacts on plants and animals that are essential for food and nutritional security, gaps in the knowledge systematized on traditional management practices that could help enhance them and their social recognition, and communities' limited access to public policies that exist in the country. This requires strategic actions that depend on governmental and non-governmental efforts, as well as research and development in synergy with the strength and social organization of *sempre-vivas* flowers gatherers' communities, in order to ensure the system's longevity, a concern with which this Dynamic Conservation Plan deals.

2. OBJECTIVES

2.1. General Objective

The objective of the Action Plan is to strengthen the resilience of the traditional agricultural system of sempre-vivas flowers gatherers' communities in the Southern Espinhaço Mountain Range, in Minas Gerais, Brazil, through integrated actions involving local communities, the Codecex, the Municipal Governments of Diamantina, Buenópolis and Presidente Kubitschek, the government of the State of Minas Gerais, non-governmental organizations and teaching and research institutions.

2.2. Specific Objectives:

The proposed actions are guided by the following specific objectives:

- i. Ensure the integrity of landscapes managed by sempre-vivas flowers gatherers' communities, and access to and the sustainable use of biodiversity.
- ii. Promote and strengthen food security through agrobiodiversity agroecological production systems and sustainable agroextrativism.
- iii. Promote participatory research, development and innovation activities that support the dynamic conservation of the sempre-vivas flowers gatherers' agricultural heritage system from local knowledge systems.
- iv. Promote access to public policies and changes to the regulatory framework for social inclusion, to recognize and ensure the rights of sempre-vivas flowers gatherers.
- v. Promote the economic inclusion of sempre-vivas flowers gatherers' families.

3. GUIDING PRINCIPLES

The actions proposed in this Action Plan are based on the following principles:

- i. **Effective participation of local communities is a pre-condition for the success of this Action Plan:** The sempre-vivas flowers gatherers are the subjects of this Action Plan. Participation must therefore be the hinge pin of the methodology used to carry out these actions, particularly involving training, research, technical assistance and rural extension.
- ii. **Ensuring food and nutritional sovereignty and security is a pre-condition for the dynamic conservation of the agricultural heritage system:** Food production for family consumption and for sale is a hinge pin of the sempre-vivas flowers gatherers' agricultural heritage system. Promoting agroecological production systems is thus fundamental to ensure food and nutritional security and the conservation of the agro-biodiversity and natural resources that underly the entire system.
- iii. **Women are protagonists in the dynamic conservation of agricultural heritage systems:** Heritage agriculture systems are characterized by the significant role played by women in conserving and managing the natural resources that underly these systems. The premise of this plan is thus the empowerment of women sempre-vivas flowers gatherers, and its actions promote their rights and economic inclusion.
- iv. **Youth are the guarantee of the present and future sustainability of agricultural heritage systems:** The dynamic conservation of agricultural heritage systems rests on conditions that ensure family succession and the maintenance of systems for passing on inter-generational knowledge. This plan therefore recognizes the need for actions that target young people, promoting their access to education, economic inclusion and stronger cultural identities.
- v. **Traditional knowledge is the starting point for the dynamic conservation of the agricultural heritage system of sempre-vivas flowers gatherers:** Overcoming the challenges and threats identified by sempre-vivas flowers gatherers' communities depends on generating new knowledge. To this end, the plan proposes research actions guided by the dialog between traditional and scientific knowledge, carried out with respect and the prior informed consent of traditional knowledge holders.
- vi. **Social control is the premise underlying the management and monitoring of this Action Plan:** As subjects in the dynamic conservation of the sempre-vivas flowers gatherers' agricultural heritage system, local communities must have seats and voices in the bodies that manage and monitor this Action Plan.

4. PARTNERSHIPS

The implementation of actions in this plan depends on partnerships involving local communities, the Codecex, teaching and research institutions, non-governmental organizations, Municipal Governments and the government of the State of Minas Gerais. Many of the partnerships were established during its preparation, and others will be identified when the plan is publicized and during fund raising. So far, the DCP has the following partners:

i. Sempre-vivas Flowers Gatherers:

- Community organizations from the municipalities of: Macacos, Mata dos Crioulos e Vargem do Inhaí (Diamantina/MG); Raiz (Presidente Kubitschek/MG); Pé de Serra and Lavra (Buenópolis/MG).
- Commission to Defend the Rights of Sempre-Viva Flowers Gatherers' Communities (Codecex)

ii. Civil Society Organizations:

- Northern Minas Alternative Agriculture Center – CAA-NM
- Terra de Direitos (Land of Rights)
- HEKS/EPER

iii. University Research and Extension Groups

- Agroecology and Peasantry Studies Center, Federal University of the Jequitinhonha and Mucuri Valleys – UFVJM
- Plant Ecophysiology Studies Center – UFVJM
- Agrarian Geography Laboratory, University of São Paulo – USP
- Ethnobiology and Agroecology Laboratory, Federal University of Juiz de Fora – UFJF
- Environmental Issues Study Group, Federal University of Minas Gerais – UFMG

iv. Government of the State of Minas Gerais

- State Secretariat of the Government of Minas Gerais – SEGOV
- Minas Gerais State Chief of Staff and Institutional Relations Office – SECCRI

- Minas Gerais State Secretariat for Agrarian Development – SEDA
- Minas Gerais State Secretariat for Human Rights, Social Participation and Citizenship – SEDPAC
- Extraordinary Secretariat for Integrated Development and Regional Fora – SEEDIF
- Minas Gerais State Secretariat for Tourism – SETUR
- State Institute for the Historical and Artistic Heritage of Minas Gerais – IEPHA
- Technical Assistance and Rural Extension Corporation of the State of Minas Gerais – EMATER

v. **Municipal Governments**

- **Municipal Government of Diamantina:**
 - ✓ Municipal Secretariat of Government
 - ✓ Municipal Secretariat of Culture, Tourism and Heritage
 - ✓ Municipal Secretariat of Agriculture, Livestock and Environment
 - ✓ Municipal Secretariat of Social Development
 - ✓ Municipal Secretariat of Education
 - ✓ Municipal Secretariat of Health
- **Municipal Government of Presidente Kubitschek**
 - ✓ Municipal Secretariat of Agriculture
 - ✓ Municipal Secretariat of Education
 - ✓ Municipal Secretariat of Social Assistance
 - ✓ Municipal Secretariat of Sports, Leisure, Culture and Tourism
 - ✓ Municipal Secretariat of Health
- **Municipal Government of Buenópolis:**
 - ✓ Municipal Secretariat of Culture, Leisure, Sports, Tourism and the Environment
 - ✓ Municipal Secretariat of Social Assistance
 - ✓ Municipal Secretariat of Education
 - ✓ Municipal Secretariat of Health

5. STRATEGIES AND ACTIONS

This Action Plan revolves around five Focus, each containing a group of priority actions. The themes and actions were all identified by local communities as the most important to respond to the challenges and threats facing the conservation of the traditional agricultural system of the sempre-vivas flowers gatherers communities in the Southern Espinhaço Range.

Key issues covered by each Strategy and their relation to the 2030 Agenda of SDGs:

- **Focus 1 – Food Security and Agrobiodiversity:** The purpose of the six actions under this Focus is to enhance production practices and traditional agroextractivism, to respond better to challenges raised by climate change and thus ensure families' food and nutritional security. The suggested actions relate directly to SDGs, especially SDG 2/Targets 2.1, 2.4 and 2.5 and SDG 15/Target 15.5.
- **Focus 2 – Local Knowledge Systems:** The purpose of the actions proposed in this Focus is to generate new knowledge to help enhance traditional management practices adopted by local communities and provide greater visibility for the environmental, economic and cultural values of the sempre-vivas flowers gatherers' traditional agricultural system. Those actions feed specifically into activities under Focus 2 and 1. Regarding the SDGs, this Focus relates directly to SDG 12/Target 12.a.
- **Focus 3 – Culture, Value System and Social Organization:** This strategy covers nine actions, whose purpose is to overcome the community's faulty access to public policies and services that are essential for their social, economic and cultural reproduction. Under the SDGs, this Focus's actions relate particularly to SDG 3/Targets 3.4 and 3.8, SDG 4/ Targets 4.5, 4.7, 4a and 4c, SDG 5/Target 5.5, SDG 7/Target 7.1, SDG 9/Targets 9.1 and 9c, SDG 11/Targets 11.2, 11.3 and 11.4.
- **Focus 4- Landscape:** This Focus aims to implement four actions targeting conflicts that affect the economic, social and cultural reproduction of traditional communities of sempre-vivas flowers gatherers. Those actions relate directly to Sustainable Development Goals (SDGs), particularly SDG 1/Target 1.4, SDG 5/Target 5.a, SDG 6/Targets 6.4 and 6.b, SDG 11/Target 11.4, SDG 15/Target 15.6.
- **Focus 5 - Value Chains and Income Generation:** This focus covers five actions whose purpose is to promote the economic inclusion of sempre-vivas flowers

gatherers. These actions relate directly to the SDGs, especially SDG 2/Target 2.3, SDG 8/Target 8.9, SDG 10/Target 10.2 and SDG 12/Target 12.3.

In addition, actions are planned Monitoring and evaluation of the Dynamic Conservation Plan (DCP) for the traditional agricultural system of the sempre-vivas flowers gatherers. The objective of the proposed actions is to ensure the democratic governance of the DCP and of the timely monitoring and evaluation of its implementation. Here we provide a detailed presentation of each Focus.

5.1. FOCUS 1: FOOD SECURITY AND AGROBIODIVERSITY

Threats, challenges and opportunities

In this system, food production goes first to ensuring food security, while cattle play a key role as “savings” in the domestic economy. Gathering sempre-vivas flowers is the many source of monetary income in the agricultural heritage system. In addition to gathering flowers to sell, other purposes of agroextractivism include providing fruit to eat, medicinal plants for traditional medicine and plant material for construction, artefacts and handicrafts. The agricultural heritage system is thus characterized by the use of a large diversity of environments, species, varieties and breeds, combining income-generating activities with production for family consumption. Another relevant aspect is the great repertoire of management practices, including the use of fire to manage sempre-vivas flowers fields, *roças de toco* plots and pastures. The use of prescribed fire to avoid burning around springs and areas with forest cover is another traditional practice.

In contrast to other countries around the world, a “zero fire” policy still prevails in Brazil, allowing no difference to be made between fires used in agricultural heritage systems and wild fires. As a result, the creation of conservation units on the common-use lands of sempre-vivas flowers gatherers has raised conflicts with environmental authorities, mainly around restrictions on traditional management practices. In recent years, however, the federal environment agency (ICMBio) began a process of internal discussions and now allows the use of controlled burning in conservation units with the presence of traditional communities. As a result, inside the national park established on the sempre-vivasa flowers gatherers common-use lands, the ICMBio has authorized research that is now under way to evaluate the effect of traditional fire management on sempre-vivas flowers populations. This creates a chance to

achieve a better understanding of traditional knowledge on that management, and even to improve it.

Surmounting conflicts over resource use thus depends on promoting sustainable production methods that combine traditional knowledge with new knowledge needed to respond to today's challenges. The need for research on traditional management practices and for technical assistance to help conserve the agricultural heritage system is a challenge recognized by the communities. To that end, current partnerships with the Agroecology and Peasantry Studies Center (NAC/UFVJM), with the Plant Ecophysiology Studies Center (NESFV/UFVJM), with the Ethnobiology and Agroecology Laboratory (LEA/UFJF) and with the CAA-NM are a chance to better understand traditional food production and agroextractivism methods and the possibilities to enhance them through agroecological approaches.

The creation of the Codecex in 2010 enabled partnerships with the CAA-NM, a civil society organization active for more than 30 years promoting agroecology, extractivism and the sustainable management of territories. This organization is part of the National Agroecology Coordination (ANA), a network of dozens of Brazilian civil society organizations with decades of experience in agroecology, nationwide. As part of this partnership, *sempre-vivas* flowers gatherers have participated in training workshops for young people and exchanges with traditional communities in Northern Minas Gerais. Those exchanges have facilitated the exchange of experiences in the fields of agrobiodiversity conservation, agroecological production, sustainable agroextractivism, territorial management for climate resilience and others. The Codecex has been active since 2013 in the Minas Gerais Semiarid Agrobiodiversity Network, which has enabled the accumulation and exchange of genetic material and practices to enhance the conservation of plant genetic resources.

The collaboration between the Codecex and the CAA-NM has partially made up for deficiencies in local communities' access to public technical assistance services. This Action Plan intends to intensify that work, expanding the technical assistance services supplied to communities. This requires support from public agencies to hire permanent technical staff and to train their personnel to work for the dynamic conservation of the agricultural heritage system, with a view towards food security and adaptation to climate change.

It is significant that Brazil has a National Policy for Technical Assistance and Rural Extension whose guidelines provide that this service focus on agroecological production. Recent years have also seen the approval of the National and State (Minas Gerais) Policies for

Agroecology and Organic Production. The progress of those policies depends on the political context, but they are important tools and benchmarks for governmental initiatives. To that end, this Strategy proposes the following actions:

- **Action 1.1:** Technical assistance and training in agroecology and sustainable agroextractivism.
- **Action 1.2:** Appreciation and promotion of the use and conservation of local seeds and breeds.
- **Action 1.3:** Improvement of sempre-vivas flowers species management practices.
- **Action 1.4:** Promotion of good fire management practices.
- **Action 1.5:** Promotion of productive homegardens and appreciation of traditional food culture.
- **Action 1.6:** Improvement and promotion of traditional medicinal plant practices.

Following are the activities planned for each action, relevant partnerships and expected outcomes. Table 1, at the end of this section, provides a timetable for implementation of the actions and the delegation of responsibilities among partner organizations.

ACTION 1.1: Technical assistance and training in agroecology and sustainable agroextractivism
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Activities:

- a. Organize the technical assistance staff to serve the sempre-vivas flowers gatherers' communities.
- b. Develop a capacity-building program in agroecological production and sustainable agroextractivism.
- c. Courses and workshops for Technical Assistance and Rural Extension (ATER) agents on agroecological production and sustainable agroextractivism.
- d. Workshops for local communities on agroecological production and sustainable agroextractivism.
- e. Exchanges between sempre-vivas flowers gatherers and other traditional communities.
- f. Production of material to disseminate agroecological production and sustainable agroextractivism practices.

Implementation Strategy:

Training of the rural extension agents will be coordinated by the Emater/MG with support from Municipal Governments, researchers in partner institutions and the CAA-NM. Capacity building for local communities will be coordinated by the Codecex, with support from the CAA-NM, researchers in partner institutions and rural extension agents.

Expected Outcomes:

- ATER staff organized to work with the sempre-vivas flowers gatherers' communities covered by the GIAHS.
- At least 12 rural extension agents trained in agroecological production and sustainable agroextractivism.
- At least 60 sempre-vivas flowers gatherers trained in agroecological production and sustainable agroextractivism, 50% of whom are women.

ACTION 1.2: Appreciation and promotion of the use and conservation of local seeds and breeds

Activities:

- a. Map out the diversity of local varieties and breeds conserved and used by communities.
- b. Exchanges between sempre-vivas flowers gatherers and other traditional communities.
- c. Support the multiplication of seeds of local varieties and of local breeds.
- d. Promote improvements in the storage facilities of family seed stocks.
- e. Organize municipal markets for local seeds and breeds.
- f. Produce a booklet on the conservation and management of local varietal seeds.
- g. Produce a booklet on best practices for the management of local breeds.

Implementation Strategy:

This action will be coordinated by Emater-MG, the Municipal Secretariats of Agriculture and Codecex, with support from the CAA-NM and researchers at partner institutions. Community organizations will be responsible for mapping out the local varieties and breeds conserved by the communities. The Municipal Governments and Emater/MG will support actions to

promote the multiplication of seeds and to improve storage facilities. This action will be implemented in coordination with action 2.3.

Expected Outcomes:

- Multiply at least 6 varieties threatened with extinction and reintroduce them into production systems.
- At least 60 families with household storage facilities for improved varieties of seeds.
- At least one municipal landrace seed market organized in each municipality.

ACTION 1.3: Improvement of sempre-vivas flowers species management practices

Activities:

- a. Systematize traditional management practices for extractivism of sempre-vivas flowers.
- b. Courses and workshops on sustainable extractivism.
- c. Publication about the protocol for managing sempre-vivas flowers.

Implementation Strategy:

This action will be coordinated by Codecex and by the NAC/UFVJM together with community organizations, with support from the CAA-NM and researchers at partner institutions, as well as rural extension agents in each municipality. Local communities will participate actively in the systematization of traditional practices and in the survey of demands for improvements in management practices. This action will be carried out in coordination with actions 4.2 and 2.1.

Expected Outcomes:

- At least 5 sempre-vivas flowers species with improved management practices.

ACTION 1.4: Promotion of good fire management practices

Activities:

- a. Systematize traditional best practices for fire management in sempre-vivas flowers gathering, pastures and slash-and-burn fields (coordinate with action 2.2).
- b. Seminar on Community-Based Fire Management.
- c. Workshops on best practices for fire management.

Implementation Strategy:

This action will be coordinated by NAC/UFVJM and by the Codecex, together with community organizations, with support from the CAA-NM, rural extension agents and researchers at partner institutions. Governmental agencies, such as the municipal Environmental Secretariats, Emater/MG and SEDA/MG will provide the institutional support required to implement the action, which will be carried out in coordination with action 2.2.

Expected Outcomes:

- At least 50% of the sempre-vivas flowers gatherers' families participate in workshops on best practices for fire management.
- At least 30 community agents trained in Community-Based Fire Management.
- At least 1 publication systematizing best practices for fire management.

ACTION 1.5: Promotion of productive homegardens and appreciation of traditional food culture

Activities:

- a. Participatory diagnosis on homegardens and traditional food culture.
- b. Workshops to exchange knowledge to enrich agrobiodiversity and enhance agroecological management in homegardens.
- c. Promote the exchange of seeds and seedlings to enrich homegardens.
- d. Educational activities in schools on traditional food culture and healthy food.

Implementation Strategy:

This action will be coordinated by the CAA-NM, the NAC/UFVJM and Codecex, together with the community organizations, with support from the CAA-NM, rural extension and SEDA/MG agents. The activities involving schools will be carried out in close partnership with the schools and the municipal Secretariats of Education.

Expected Outcomes:

- At least 5 groups of women participating in workshops on productive homegardens and food culture.

- At least 5 schools with awareness-building activities on traditional food culture and healthy food.
- Publication systematizing aspects of traditional food culture.

ACTION 1.6: Improvement and promotion of traditional medicinal plant practices

Activities:

- a. Participatory diagnosis on traditional practices in the use of medicinal plants in phytotherapy.
- b. Workshops to exchange traditional and scientific knowledge on the use of phytotherapeutics.
- c. Work with municipal and State health services to expand the use of phytotherapeutics in public basic healthcare services, in line with the National Policy on Integrative and Complementary Practices (PNPIC) in the SUS, and the National Medicinal and Phytotherapeutic Plants Program.

Implementation Strategy:

This action will be coordinated by the Codecex in partnership with community organizations, and with support from the CAA-NM and the Municipal Secretariats of Health and Education.

Expected Outcomes:

- At least 20 sempre-vivas flowers gatherers trained in the courses and workshops on phytotherapeutics.
- Establish one community herb garden per community, with catalogs on the plants validated for phytotherapeutic uses.

Table 1: Synthesis of actions, responsibilities, implementation timetable and budget

ACTIONS	Responsables		Year 1	Year 2	Year 3	Year 4	Year 5	Total R\$	Total US\$ ³⁵	Counterpart US\$	External Financing (US\$)
	Coordinaton	Partners									
ACTION 1.1: Technical assistance and training in agroecology and sustainable agroextractivism	Emater-MG Codecex	Communiy Organizations, CAA-NM NAC, SEDA	X	X	X	X	X	1.881.525,80	537.578,80	0,00	537.578,80
ACTION 1.2: Appreciation and promotion of the use and conservation of local seeds and breeds.	Emater-MG, Municipal Secretariats of Agriculture, Codecex	Communiy Organizations, CAA-NM, NAC, SEDA		X	X	X		183.798,00	52.513,71	0,00	52.513,71
ACTION 1.3: Improvement of sempre-vivas species management practices	Codecex, NAC	Communiy Organizations, CAA-NM, Emater-MG, SEDA		X	X	X		73.399,40	20.971,26	0,00	20.971,26
ACTION 1.4: Promotion of good fire management practices	Codecex, NAC	Communiy Organizations, CAA-NM, Emater-MG, SEDA		X	X	X		89.849,40	25.671,26	171,43	25.499,83
ACTION 1.5: Promotion of productive homegardens and appreciation of traditional food culture	CAA-NM NAC Codecex	Communiy Organizations, Municipal Secretariats of Education, Emater-MG, SEDA	X	X				46.299,40	13.228,40	5.142,86	8.085,54
ACTION 1.6: Improvement and promotion of traditional medicinal plant practices	Codecex	CAA-NM Municipal Secretariats Education, and Health, State Government	X	X	X			20.949,40	5.985,54	0,00	5.985,54
TOTAL								2.295.821,40	655.948,97	5.314,29	650.634,69

³⁵ Exchange rate US\$1,00 = R\$3,50

5.2. FOCUS 2: LOCAL KNOWLEDGE SYSTEMS

Threats, challenges and opportunities

In past decades, research done in this region focused mainly on geology and botany, ignoring traditional and local practices and knowledge about species and landscape management. That research was grounds for the creation of fully protected conservation units, ignoring the *sempre-vivas* flowers gatherers' communities and their importance for maintaining native and agricultural biodiversity and for protecting water resources. The absence of dialog with local communities became a threat to their right to remain in their space and an obstacle to the identification of effective solutions that might ally conservation with the sustainable use of native *sempre-vivas* species.

Aware of the need for such dialog, the Codecex has built partnerships with researchers at universities and other institutes. This work has given rise to opportunities for methodological innovations that concretely integrate traditional with scientific knowledge. Over the past decade, researchers at the UFVJM (NAC and NESFV), the UFMG (GESTA), the USP (LGA) and the UFJF (LEA) have done studies, for example, on managing native species and agro-biodiversity, on the traditional way of life of *sempre-vivas* flowers gatherers' communities and on participatory monitoring of the resilience of agroecosystems. There has also been collaboration in training activities and the dissemination of information validated by their research.

As a result, recent studies have revealed important aspects of this agricultural heritage system which were essential for the preparation of this GIAHS candidacy proposal. Ongoing research is still examining community territorialities, traditional *sempre-vivas* flowers management practices, the conservation of agrobiodiversity and agroecosystem management. One major challenge today is how climate change is imposing shifts on the system's own logic. While the ecology of burning and the management/domestication of landscapes are posited as needs, there is also a need to identify new, more resilient agro-food strategies and to enhance traditional practices, including pastures and slash-and-burn farming.

This Action Plan intends to intensify research with a participatory approach, in dialog with traditional knowledge, using existing partnerships with the research groups. All the studies will be carried out with the communities' prior informed consent, obeying the country's legal requirements for access to traditional knowledge. This will also generate

inputs for the actions proposed in *Focus 2 – Local knowledge systems*. These are the proposed actions for research:

- **Action 2.1:** Research on population dynamics of sempre-vivas flowers species, including fire management.
- **Action 2.2:** Research on fire ecology in managing pastures and *roças de toco* (slash-and-burn agriculture system).
- **Action 2.3:** Research on the use and conservation of plant and animal genetic resources.
- **Action 2.4:** Research on ecosystemic, sociocultural and economic values in the sempre-vivas flowers gatherers' agricultural heritage system.
- **Action 2.5:** Research on territorial dynamics and the cultural dimension of the sempre-vivas flowers gatherers' agricultural heritage system.

Following are the activities planned for each action, relevant partnerships and expected outcomes. Table 2, at the end of this section, provides a timetable for implementation of the actions and the delegation of responsibilities among partner organizations.

ACTION 2.1: Research on population dynamics of sempre-vivas flowers species, including fire management

Activities:

- a. Field surveys on the population of sempre-vivas flowers species.
- b. Surveys of traditional knowledge, with the local communities' prior informed consent.
- c. Field experiments to assess sempre-vivas flowers species.
- d. Experiments with traditional sempre-vivas flowers management practices.
- e. Hold a technical seminar to analyze and publicize the outcomes of the studies.
- f. Systematize the outcomes of the research in various formats, to be disseminated to local communities, the scientific community and public policy makers.

Implementation Strategy:

This action will be coordinated by research groups and carried out in a participatory manner with local communities. Training opportunities provided during the research will be shared with all the communities and technical personnel at partner institutions and rural extension

agencies. Municipal governments, partner universities, the Emater/MG and the SEDA/MG will provide institutional support for seminars and dissemination of their outcomes. This action will be carried out in coordination with actions 1.1 and 5.1.

Expected Outcomes:

- Systematize and publish information on the population dynamics of at least one sempre-vivas flowers species.
- Publish at least one scientific article on the population dynamics of sempre-vivas flowers.
- Produce at least one publication in a format suitable for disseminating outcomes to sempre-vivas flowers gatherers' communities.

ACTION 2.2: Research on fire ecology in managing pastures and *roças de toco* (slash-and-burn agriculture system)

Activities:

- a. Survey traditional practices for managing fire.
- b. Set up field experiments to verify the behavior of pastures.
- c. Monitoring studies on the dynamics of organic material and nutrients in the presence of fire in slash-and-burn agriculture systems (*roça de toco*).
- d. Hold a technical seminar to analyze and disseminate outcomes of the studies.
- e. Systematize the outcomes of the research in various formats, to be disseminated to local communities, the scientific community and public policy makers.

Implementation Strategy:

This action will be coordinated by research groups and carried out in a participatory manner with local communities. Training opportunities provided during the research will be shared with all the communities and technical personnel at partner institutions and rural extension agencies. Municipal governments, partner universities, the Emater/MG and the SEDA/MG will give institutional support for seminars and dissemination of their outcomes. This action will be carried out in coordination with action 1.4.

Expected Outcomes:

- Publish at least one scientific article with recommendations on fire management.
- Produce at least one publication in a format suitable for disseminating outcomes to sempre-vivas flowers gatherers' communities.

ACTION 2.3: Research on the use and conservation of plant and animal genetic resources

Activities:

- a. Survey of plant and animal genetic resources in the agricultural heritage system of sempre-vivas flowers gatherers, and their management practices for these resources.
- b. Studies to identify the most resilient varieties and breeds.
- c. Hold a technical seminar to analyze and publicize outcomes of the studies.
- d. Systematize the outcomes of the research in various formats, to be disseminated to local communities, the scientific community and public policy makers.

Implementation Strategy:

This action will be coordinated by research groups and carried out in a participatory manner with local communities. Training opportunities provided during the research will be shared with all the communities and technical personnel at partner institutions and rural extension agencies. Municipal governments, partner universities, the Emater/MG and the SEDA/MG will give institutional support for seminars and dissemination of their outcomes. This action will be carried out in coordination with action 1.2.

Expected Outcomes:

- Publish at least one scientific article with recommendations for managing plant and animal genetic resources.
- Produce at least one publication in a format suitable for disseminating outcomes to sempre-vivas flowers gatherers' communities.

ACTION 2.4: Research on ecosystemic, sociocultural and economic values in the sempre-vivas flowers gatherers' agricultural heritage system

Activities:

- a. Studies on the dynamics of carbon and water in the sempre-vivas flowers gatherers' agricultural heritage system.
- b. Studies on establishing the economic value of the ecosystemic and environmental services of the sempre-vivas flowers gatherers' agricultural heritage system.
- c. Technical seminar to analyze and disseminate outcomes of the studies.
- d. Systematize outcomes of the research in various formats, to disseminate to local communities, the scientific community and public policy makers.

Implementation Strategy:

This action will be coordinated by research groups and carried out in a participatory manner with local communities. Training opportunities provided during the research will be shared with all communities and technical personnel at partner institutions and rural extension agencies. Municipal governments, partner universities, the Emater/MG and the SEDA/MG will provide institutional support for seminars and dissemination of their outcomes. This action will be carried out in coordination with action 1.4.

Expected Outcomes:

- Publish at least one scientific article, analyzing the ecosystemic, socio-cultural and economic values of the sempre-vivas flowers gatherers' agricultural heritage system.
- Produce at least one publication in a format suitable for disseminating outcomes to sempre-vivas flowers gatherers' communities.

ACTION 2.5: Research on territorial dynamics and the cultural dimension of the sempre-vivas flowers gatherers' agricultural heritage system

Activities:

- a. Carry out studies on traditional food culture.
- b. Carry out studies on social relations involving gender.
- c. Carry out studies on territorial dynamics, traditional knowledge and inter-generation transmission.
- d. Hold a technical seminar to analyze and publicize outcomes of the studies.

- e. Produce material to disseminate outcomes of the research in various formats, to local communities, the scientific community and public policy makers.

Implementation Strategy:

This action will be coordinated by research groups and carried out in a participatory manner with local communities. Training opportunities provided during the research will be shared with all the communities and technical personnel at partner institutions and rural extension agencies. Municipal governments, partner universities, the Emater/MG and the SEDA/MG will provide institutional support for seminars and dissemination of the outcomes of research.

Expected Outcomes:

- Publish at least one scientific article on the cultural dimension of the agricultural heritage system of the sempre-vivas flowers gatherers.
- Produce at least one publication in a format suitable for disseminating outcomes to sempre-vivas flowers gatherers' communities.

Table 1: Synthesis of actions, responsibilities, implementation timetable and budget

ACTIONS	Responsables		Year 1	Year 2	Year 3	Year 4	Year 5	Total R\$	Total US\$ ³⁶	Counterpart US\$	External Financing (US\$)
	Coordination	Partners									
ACTION 2.1: Research on population dynamics of sempre-vivas flowers species, including fire management	NAC	Community Organizations, Codecex, Emater-MG, SEDA	X	X	X	X	X	448.362,00	128.103,43	90.342,86	37.760,57
ACTION 2.2: Research on fire ecology in managing pastures and <i>roças de toco</i> (slash-and-burn agriculture system)	NAC	Community Organizations, Codecex, Emater-MG, SEDA			X	X	X	527.062,80	150.589,37	90.342,86	60.246,51
ACTION 2.3: Research on the use and conservation of plant and animal genetic resources	NAC	Community Organizations, Codecex, CAA-NM, Emater-MG, SEDA	X	X	X			430.762,80	123.075,09	90.685,71	32.389,37
ACTION 2.4: Research on ecosystemic, sociocultural and economic values in the sempre-vivas flowers gatherers' agricultural heritage system	NAC	Community Organizations, Codecex, Emater-MG, SEDA				X	X	439.913,20	125.689,49	90.342,86	35.346,63
ACTION 2.5: Research on territorial dynamics and the cultural dimension of the sempre-vivas flowers gatherers' agricultural heritage system	NAC	Community Organizations, Codecex, Emater-MG, SEDA	X	X	X			447.312,80	127.803,66	90.342,86	37.460,80
TOTAL								2.293.413,60	655.261,03	452.057,14	203.203,89

³⁶ Exchange rate US\$1,00 = R\$3,50

5.3. FOCUS 3: CULTURE, VALUE SYSTEM AND SOCIAL ORGANISATION

Threats, challenges and opportunities

Most rural areas in Brazil are short on essential infrastructure and public services. The reality of *sempre-vivas* flowers gatherers in the Southern Espinhaço Range in Minas Gerais is no different. The communities have long demanded better access to health, education and transportation services, as well as infrastructure to supply water, electric power and communications. Public policies do exist in Brazil to cover those needs, the challenge being how to expand the communities' access to such services.

Although the communities in this Plan are, on the average, located 60 km from the municipal seats, none of them have public transportation and there are no ambulance services for health emergencies. Transportation into city centers depends on private services provided by a few car owners. The communities also emphasize the need for schools suited to their reality as *sempre-vivas* flowers gatherers, and to their *quilombola* culture. More visits by physicians is another demand.

Most of the *sempre-vivas* flowers gatherers' communities are in areas with abundant water. In the Pé de Serra and the Lavra communities, however, located in the dryer *sertão* region, the impacts of water shortages caused by climate change are already clear. This has already awoken their interest in building water-storage facilities, for both humans and livestock to consume.

Five communities have access to electric power. Only Mata dos Crioulos, a *quilombola* community with 150 families, does not. It is on the waiting list for rural electrification at the Minas Gerais Energy Company (Cemig), but the work has yet to begin. Access to communication is limited. On the other hand, regarding internet, the Municipal Governments of Diamantina and Presidente Kubitschek signed up to the federal "Internet for All" program launched in 2018, which promises to reach rural communities. The registration of the *sempre-vivas* flowers gatherers' communities is an opportunity to improve their connections to the world, especially for communities that already have electric power. There is also a demand, mainly from young people, to expand community facilities for sports.

All those demands are already on existing public policy agendas. Expanding and improving access to public services, among other obstacles, is subject to local governments' budget restrictions. In small municipalities local revenue sources are limited, and more funding depends on transfers from State and federal programs.

The seats occupied by the Codecex on the CEPCT and CNPCT are channels for sempre-vivas flowers gatherers and quilombolas communities to draw attention to their municipalities, facilitating their local governments’ access to State and federal public funding earmarked for traditional communities. On a municipal scale, there is room to improve the representation of sempre-vivas flowers gatherers on local policy-making boards. To deal with these challenges, this Strategy includes the following actions:

- **Action 3.1:** Adaptation of municipal legal frameworks to recognize the sempre-vivas flowers gatherers’ agricultural heritage system.
- **Action 3.2:** Strengthen representation of sempre-vivas flowers gatherers in civil-society consultation processes.
- **Action 3.3:** Promotion and expansion of access to public health services.
- **Action 3.4:** Expansion of access to public education services
- **Action 3.5:** Improvements in water and sanitation infrastructure and supply.
- **Action 3.6:** Expansion of access to energy and communication services.
- **Action 3.7:** Improvements in roads and transportation services.
- **Action 3.8:** Expansion of access to social welfare policies.
- **Action 3.9:** Expansion of access to culture and leisure services.

Following are the activities planned for each action, relevant partnerships and expected outcomes. Table 3, at the end of this section, provides a timetable for implementation of the actions and the delegation of responsibilities among partner organizations.

ACTION 3.1: Adaptation of municipal legal frameworks to recognize the sempre-vivas flowers gatherers’ agricultural heritage system

Activities:

- a. Mobilize communities to discuss the terms of a municipal bill of law that would recognize the sempre-vivas flowers gatherers’ agricultural heritage system.
- b. Identify the most effective way to ensure enforcement of the new law.
- c. Draft a bill of law in coordination with the Codecex, local communities and municipal heritage and culture authorities, to safeguard the communities’ specific cultural manifestations.
- d. Organize awareness-building sessions at the local city councils in each municipality.

- e. Capacity building for local authorities to implement inter-sectoral actions.

Implementation Strategy:

This activity will be coordinated by the Municipal Governments and by Codecex, together with community organizations. The IEPHA will be called in to help draft the bills. Once a draft is ready, it will be sent to municipal City Councils to be processed as a bill of law.

Expected Outcomes:

- Bills recognizing the sempre-vivas flowers gatherers' agricultural heritage system passed in three municipalities (Buenópolis, Diamantina and Presidente Kubitschek).
- 30 municipal authorities trained to implement inter-sectoral actions for the sempre-vivas flowers gatherers' communities.

ACTION 3.2: Strengthen representation of sempre-vivas flowers gatherers in civil-society consultation processes

Activities:

- a. Capacity-building for sempre-vivas flowers gatherers to participate on boards that deal with public policies.
- b. Create conditions for the effective participation of representatives of sempre-vivas flowers gatherers on municipal boards chosen by communities and the Codecex.
- c. Attend meetings of boards with civil-society representatives that are relevant to sempre-vivas flowers gatherers.
- d. Develop a means for communicating news to communities on the progress of agendas in the boards.

Implementation Strategy:

This activity will be coordinated by the municipal boards and by the Codecex, together with community organizations and supported by municipal agencies that chair the boards. The Municipal Governments will find the means to facilitate the participation of representatives of the sempre-vivas flowers gatherers, to improve and enhance mechanisms that enable public transparency.

Expected Outcomes:

- Sempre-vivas flowers gatherers' communities are represented on relevant municipal boards.

ACTION 3.3: Promotion and expansion of access to public health services

Activities:

- a. Formalize an agreement among the Municipal Governments for Diamantina to be responsible for servicing the Mata dos Crioulos community.
- b. Set up Healthcare Support Points in communities where this service is not available.
- c. Establish a healthcare program suited to specificities of *quilombola* communities.
- d. Prevention campaigns and treatment actions in the field of dental care.
- e. Define a protocol to expedite care for sempre-vivas flowers gatherers who go to healthcare units in the municipal seats.
- f. Improve and/or create a transportation system to handle health and dental emergencies.
- g. Set up nutritional programs in each community, to promote proper and healthy diets for different age groups.

Implementation Strategy:

These actions will be coordinated and carried out by the municipal Secretariats of Health, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex.

Expected Outcomes:

- 100% of the communities with healthcare services suitable to their demands.

ACTION 3.4: Expansion of access to public education services

Activities:

- a. Formalize an agreement among the Municipal Governments for Diamantina to be responsible for servicing the Mata dos Crioulos community.
- b. Prepare a diagnosis of the situation of schools in the sempre-vivas flowers gatherers' communities.
- c. Make investments to improve infrastructure in the schools.

- d. Adapt the school calendar to the needs of sempre-vivas flowers gatherers' communities.
- e. Capacity-building courses for educators on teaching content and practices suitable to the reality of sempre-vivas flowers gatherers' communities.
- f. Establish Quilombola Schools in the Raiz, Mata dos Crioulos and Vargem do Inhaí communities.

Implementation Strategy:

These actions will be coordinated and carried out by the municipal Secretariats of Education, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex.

Expected Outcomes:

- 100% of rural schools adapted to the needs of sempre-vivas flowers gatherers' communities.
- At least 30 educators trained in teaching content and practices suitable to the reality of sempre-vivas flowers gatherers' communities.
- At least three Quilombola Schools established.
- 100% of the communities with regular school bus service.

ACTION 3.5: Improvements in water and sanitation infrastructure and supply

Activities:

- a. Formalize an agreement among the Municipal Governments for Diamantina to be responsible for servicing the Mata dos Crioulos community.
- b. Implement and/or adapt and maintain water supply systems in all the communities, in line with community management principles.
- c. Install cement plate cisterns to store rainwater in the Pé de Serra and Lavra communities.
- d. Carry out maintenance on artesian wells in the Pé de Serra community.
- e. Adapt the water supply system for community agro-industries.
- f. Public works to improve the communities' sanitation conditions.

Implementation Strategy:

These actions will be coordinated and carried out by the respective Municipal Governments, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex.

Expected Outcomes:

- 100% of communities with water supply systems installed and operational.
- At least 30 cement plate cisterns installed in the Lavras and Pé de Serra communities.
- At least 1 community agro-industry with an adapted water supply system.
- At least 35 sanitation modules installed.

ACTION 3.6: Expansion of access to energy and communication services

Activities:

- a. Dialog with Cemig to advocate for conclusion of works to supply electric power to the Mata dos Crioulos *quilombola* community.
- b. Dialog with Cemig to advocate for periodic maintenance of electric power grids serving *sempre-vivas* flowers gatherers' communities.
- c. Install lighting in community churches in Pé de Serra and Buenópolis.
- d. Dialog with mobile telephone operators to advocate for installation of towers in communities still not covered by this service.
- e. Register all *sempre-vivas* flowers gatherers' communities for the "Internet for All" program.
- f. Install public computer centers in the *sempre-vivas* flowers gatherers' communities.
- g. Courses to promote the digital inclusion of young people.

Implementation Strategy:

These actions will be coordinated and carried out by the respective Municipal Governments, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex. The Emater/MG and SEMAD will support the local governments in their dialog with Cemig and mobile telephone operators.

Expected Outcomes:

- 100% of the communities with electric power services.

- 100% of the communities with access to mobile phone and internet services.
- 100% of the communities with public computer centers operating with internet access.
- At least 5 young people in each community conclude the course to promote digital inclusion, 50% of them being women.

ACTION 3.7: Improvements in roads and transportation services

Activities:

- a. Formalize an agreement between the Diamantina and Buenópolis governments to design a project to open and revitalize the Serra-Sertão highway.
- b. Build bridges and maintain existing bridges in the Pé de Serra, Lavra, Vargem do Inhaí and Mata dos Crioulos communities.
- c. Carry out periodic maintenance on the roads in all the communities.
- d. Install and maintain cattle guards in the Pé de Serra, Lavra, Vargem do Inhaí and Mata dos Crioulos communities.

Implementation Strategy:

These actions will be coordinated and carried out by the respective Municipal Governments, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex. The Emater/MG and SEMAD will support local governments in their dialog with environmental authorities on matters regarding the Sertão-Serra Highway.

Expected Outcomes:

- Sertão-Serra Highway open for use in suitable conditions for local communities' traffic.
- 100% of the roads in good traffic conditions.

ACTION 3.8: Expansion of access to social welfare policies

Activities:

- a. Register sempre-vivas flowers gatherers families' eligible for the Family Stipend but still not covered by the program, considering the specificities of the *quilombola* communities.
- b. Register families eligible for the Electric Power Social Rate but still not covered by it.
- c. Adapt and improve facilities at the Social Assistance Reference Centers (CRAS).

- d. Establish a partnership between the municipal Secretariats of Education and the local organizations to implement the Comprehensive Family Service Program (PAIF).
- e. Design and implement a project to reopen the Buenópolis Popular Restaurant.

Implementation Strategy:

These actions will be coordinated and carried out by the respective Municipal Governments, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex.

Expected Outcomes:

- 100% of eligible sempre-vivas flowers gatherers families registered for the Family Stipend.
- 100% of eligible sempre-vivas flowers gatherers families registered in the Electric Power Social Rate Program.
- PAIF Program operational in all the communities.
- Buenópolis Popular Restaurant reopened and operating.

ACTION 3.9: Expansion of access to culture and leisure services

Activities:

- a. Exhibitions of photographs and of documentaries on the AHS.
- b. Construction of sports and leisure facilities in the communities.

Implementation Strategy:

These actions will be coordinated and carried out by the respective Municipal Governments, in partnership with the State government and in ongoing consultation with the community organizations and the Codecex.

Expected Outcomes:

- At least 1 exhibition held in each municipality and 3 exhibitions held in capital cities.
- At least 3 communities with sports and leisure facilities installed.

Table 3: Synthesis of actions, responsibilities, implementation timetable and budget

ACTIONS	Responsables		Year 1	Year 2	Year 3	Year 4	Year 5	Total R\$	Total US\$ ³⁷	Counterpart US\$	External Financing (US\$)
	Coordination	Partners									
ACTION 3.1: Adaptation of municipal legal frameworks to recognize the sempre-vivas flowers gatherers' agricultural heritage system	Municipal Secretariats of Culture and Government, Codecex	Community Organizations, IEPHA	X	X	X			182.757,00	52.216,28	171,43	52.044,85
ACTION 3.2: Strengthen representation of sempre-vivas flowers gatherers in civil-society consultation processes	Municipal Councils, Codecex	Community Organizations, Municipal Governments		X	X	X	X	476.898,00	136.256,57	342,86	135.913,71
ACTION 3.3: Promotion and expansion of access to public health services	Municipal Secretariats of Health	State Government	X	X	X			699.857,60	199.959,31	18.514,29	181.445,03
ACTION 3.4: Expansion of access to public education services	Municipal Secretariats of Education	SES-MG	X	X				318.069,80	90.877,09	37.857,09	53.020,00
ACTION 3.5: Improvements in water and sanitation infrastructure and supply	Municipal Governments	State Government	X	X				978.967,57	279.705,02	105.419,31	174.285,71
ACTION 3.6: Expansion of access to energy and communication services	Municipal Governments	State Government	X	X	X			414.120,00	118.320,00	0,00	118.320,00
ACTION 3.7: Improvements in roads and transportation services	Municipal Governments	State Government	X	X	X	X		2.406.000,00	687.428,57	222.857,14	464.571,43
ACTION 3.8: Expansion of access to social welfare policies	Municipal Governments	State Government		X	X			96.197,60	27.485,03	2.914,29	24.570,74

³⁷ Exchange rate US\$1,00 = R\$3,50

ACTION 3.9: Expansion of access to culture and leisure services	Municipal Governments	State Government, Community Organizations, Codecex			X	X		195.499,80	55.857,09	0,00	55.857,09
TOTAL								5.768.367,37	1.648.104,96	388.076,39	1.260.028,57

5.4. FOCUS 4: LANDSCAPE

Threats, challenges and opportunities

Landscape management is one of the specificities of the way of life of sempre-vivas flowers gatherers. It makes the integrity of the landscape and the guarantee of access to biodiversity strategic actions for the sustainability of this agricultural heritage system. Historically, disrespect for the rights of the sempre-vivas flowers gatherers' ancestral lands and way of life has been the greatest threat to the conservation of their agricultural heritage system. The creation of federal and State conservation units (CUs) without consulting the local communities, the establishment of mining companies and the expansion of huge monocrops of eucalyptus and pasture land have been the main pressures on their traditional agricultural system. Those forms of territorial occupation have had negative impacts on the continuity of the way of life of sempre-vivas flowers gatherers, restricting their rights to access and to use biodiversity.

In response, in 2010 local communities united and organized the Commission to Defend the Rights of Sempre-viva Flowers Gatherers' Communities (Codecex), which has worked to disseminate the way of life of the sempre-vivas flowers gatherers and to lobby public authorities responsible for ensuring their rights. As a result, the sempre-vivas flowers gatherers have won recognition and a seat on the National Council of Traditional Peoples and Communities, a federal body with representatives of traditional peoples throughout Brazil.

Coordinated actions with other social movements in the State of Minas Gerais brought the creation of the State Commission for the Sustainable Development of Traditional Peoples and Communities (CEPCT), on which the Codecex also has a seat. Its participation in these bodies has afforded greater visibility to the sempre-vivas flowers gatherers, as well as a channel to negotiate their demands with authorities. Reinforcing this, the ongoing work of the Codecex to defend the rights of local communities has brought victories, such as the certification by the federal Palmares Foundation of the quilombola communities in Mata dos Crioulos (in 2010), Vargem do Inhaí (2011) and Raiz (2015).

Even so, threats have redoubled with the arrival of new mining projects. Despite Codecex's efforts to find solutions to conflicts with the CUs, there are still restrictions on access by communities to traditional use areas overlapping the new CUs. The regularization of quilombola territories, which have specific federal policies in their favor, has not been concluded. Meanwhile, the recent Minas Gerais State Policy on Traditional Peoples and

Communities provides for the regularization of collective territories, and actions in this direction have been initiated. This creates a possibility for regularizing the areas of sempre-vivas flowers gatherers, under a specific agrarian regime.

The aggravation of the climate crisis raises additional challenges for the integrity of landscapes. Data has been systematized that confirms the impacts of climate change on the semi-arid region of Minas Gerais, where alterations in water supply are already visible. Communities in the *sertão* region point to the need to intensify measures for community water management. There is a growing number of experiences in nearby regions and in the scope of the Brazilian Semi-arid Coordination (a network of civil society organizations), also active in Minas Gerais providing learning opportunities in social technologies for this challenge.

This Strategy thus proposes four actions to ensure the continuity of current initiatives and to achieve, within five years, solutions that will ensure sempre-vivas flowers gatherers communities' territorial and cultural rights, as well as their rights to access and to use biodiversity. These are the proposed actions:

- **Action 4.1:** Official recognition and land tenure regularization of the territories of sempre-vivas flowers gatherers in the Southern Espinhaço Range (MG, Brazil).
- **Action 4.2:** Drafting of Biocultural Community and Consultation Protocols to ensure biodiversity access and use rights.
- **Action 4.3:** Promotion of good community management practices for water as a common good.
- **Action 4.4:** Promotion of the sempre-vivas flowers gatherers communities' cultural heritage.

Following are the activities planned for each action, relevant partnerships and expected outcomes. Table 4, at the end of this section, provides a timetable for implementation of the actions and the delegation of responsibilities among partner organizations.

ACTION 4.1: Official recognition and land tenure regularization of the territories of sempre-vivas flowers gatherers in the Southern Espinhaço Range (MG, Brazil)

Activities:

- a. Courses and workshops on the rights of traditional communities and sempre-vivas flowers gatherers.
- b. An anthropological study on the Raiz Quilombo (Presidente Kubitschek/MG), to support the Technical Identification and Delimitation Report (RTID).
- c. Advocacy actions at the National Agrarian Settlement and Reform Institute (INCRA) for the land-tenure regularization and deeding of the Mata dos Crioulos and Vargem do Inhaí Quilombos, in Diamantina.
- d. Studies for the recognition of the sempre-vivas flowers gatherers' traditional agricultural system as an immaterial heritage of the State of Minas Gerais.
- e. File application at the CEPCT to issue self-definition certificates as sempre-vivas flowers gatherers for the six communities covered by this Plan.
- f. Obtain the signature of a formal agreement between the community affected by the creation of the Rio Preto State Park and the State Forestry Institute (IEF), in accordance with the Normative Instruction drafted by the CEPCT and the IEFD, until the CU is recategorized or the area encroaching on the Mata dos Crioulos quilombola territory is separated from the park.
- g. Obtain the signature of a formal agreement between the communities affected by the creation of the Sempre-vivas Flowers National Park and the Chico Mendes Biodiversity Conservation Institute (ICMBio), in accordance with Recommendation 14/2017 by the Regional Citizens' Rights Representation of the Federal Prosecutor's Office (MPF), until the CU is recategorized or the area encroaching on quilombola territories is separated from the park.
- h. Post signs around the traditional territories of the sempre-vivas flowers gatherers.
- i. Mobilize existing official mechanisms and programs of the State and federal governments to protect human rights defenders in the communities of sempre-vivas flowers gatherers.

Implementation Strategy:

This action will be coordinated by SEDA, IEPHA and Codecex, with support from outside consultants and researchers at partner institutions. Codecex and the community organizations

of sempre-vivas flowers gatherers will do local mobilizing for the advocacy actions at the councils, commissions and other relevant bodies and authorities. The anthropological study will be carried out through an agreement between partners. The IEPHA will do the studies for the recognition of the agricultural heritage system of the sempre-vivas flowers gatherers as an immaterial heritage of Minas Gerais. The CEPCT will file for the sempre-vivas flowers gatherers' self-definition certificates and mediate agreements with environmental authorities. This will also open the dialogue with the institutions with authority to implement land-tenure regularization processes.

Expected Outcomes:

- At least 2 quilombola territories deeded.
- One sempre-vivas flowers gatherers' territory deeded under Decree 47,289 dated November 20, 2017, by the Government of Minas Gerais.
- 6 communities mapped and certified by the CEPCT as traditional communities under Decree 47,289 dated November 20, 2017, by the Government of Minas Gerais.
- Agricultural heritage system of the sempre-vivas flowers gatherers recognized as immaterial heritage of Minas Gerais.
- Agreement signed between the Mata dos Crioulos community, affected by the Rio Preto State Park, and the IEF.
- Agreements signed between the Macacos, Vargem do Inhaí, Pé de Serra and Lavra communities, affected by the Sempre-vivas National Park, and the responsible institution.
- Sign posts placed around 100% of the territories used by sempre-vivas flowers gatherers.

ACTION 4.2: Drafting of Biocultural Community and Consultation Protocols to ensure biodiversity access and use rights

Activities:

- a. Community meetings to draft the content of biocultural community and consultation protocols.
- b. Inter-community meetings to exchange experiences with biocultural protocols.
- c. Production of educational material to publicize the biocultural protocols.

- d. Political advocacy actions for the recognition of the community biocultural protocols by public authorities and by the councils active in the territories covered by this Plan.

Implementation Strategy:

This action will be coordinated by Codecex with support from organizations Terra de Direitos and CAA-NM. Local organizations will mobilize the communities for the working meetings to draft the community protocols.

Expected Outcomes:

- At least 3 community biocultural protocols drafted and approved by the communities.
- At least 3 community consultation protocols drafted and approved by the communities.

ACTION 4.3: Promotion of good community management practices for water as a common good

Activities:

- a. Systematize local practices involving community water management.
- b. Training workshops to improve traditional practices involving community water management.
- c. Exchanges of experiences involving community water management with other traditional communities.
- d. Establish practices for the conservation of springs using techniques that are suitable to the socio-cultural context of the sempre-vivas flowers gatherers' communities.
- e. Build small dams to store water, prioritizing communities most affected by climate change.
- f. Monitoring and advocacy around decisions to be made by the River Basin Committee of the Minas Gerais Tributaries of the Upper Jequitinhonha, the River Basin Committee of the Rio das Velhas and the River Basin Committee of the Jequitaí and Pacuí Rivers.

Implementation Strategy:

This action will be coordinated by Codecex with support from the CAA-NM, researchers from partner institutions and rural extension agents active in the municipalities covered by

this Plan. The Codecex and the sempre-vivas flowers gatherers' community associations will do local mobilization to systematize and disseminate good community water management practices. The CAA-NM and the researchers will support the training activities. The rural extension agents will monitor activities to conserve springs and the building of small water storage dams.

Expected Outcomes:

- At least 5 springs with conservation actions complete.
- At least 10 small dams built in the Pé de Serra and Lavra communities, in the municipality of Buenópolis.

ACTION 4.4: Promotion of the sempre-vivas flowers gatherers communities' cultural heritage

Activities:

- a. Inventory and strengthening of existing cultural manifestations.
- b. Heritage education actions in local schools and organizations in the sempre-vivas flowers gatherers' communities.
- c. Build a document and information center about the territories covered by this Plan, in the Diamantina Municipal Library.
- d. Organize Festivals of the Sempre-vivas Flowers Gatherers.

Implementation Strategy:

This activity will be carried out by the Municipal Culture Secretariats in partnership with the Municipal Education Secretariats and IEPHA, in agreement with the sempre-vivas flowers gatherers' traditional communities and Codecex. Municipal authorities, the Emater/MG and SEDA/MG will provide the institutional support required to organize the Festivals.

Expected Outcomes:

- At least 3 communities with inventories of their cultural manifestations.
- Documentation and information center established in the Diamantina Municipal Library.

Table 4: Synthesis of actions, responsibilities, implementation timetable and budget

ACTIONS	Responsables		Year 1	Year 2	Year 3	Year 4	Year 5	Total RS	Total US\$ ³⁸	Counterpart US\$	External Financing (US\$)
	Coordenation	Partners									
ACTION 4.1: Official recognition and land tenure regularization of the territories of sempre-vivas flowers gatherers in the Southern Espinhaço Range (MG, Brazil)	SEDA IEPHA Codecex	Community Organizations, CEPCT, NAC	X	X	X	X	X	484.128,20	138.322,34	66.945,61	71.376,73
ACTION 4.2: Drafting of Biocultural Community and Consultation Protocols to ensure biodiversity access and use rights	Codecex	Community Organizations, CAA-NM, Terra de Direitos NAC	X	X				80.498,80	22.999,66	20.485,37	2.514,29
ACTION 4.3: Promotion of good community management practices for water as a common good.	Codecex	Community Organizations, CAA-NM Emater-MG, NAC		X	X			237.004,00	67.715,43	0,00	67.715,43
ACTION 4.4: Promotion of the sempre-vivas flowers gatherers communities' cultural heritage	Municipal Secretariats of Culture IEPHA	Community Organizations, Codecex, Municipal Secretariats of Education, Agriculture and Environment Emater-MG, SEDA		X	X	X	X	667.000,00	190.571,43	63.885,71	126.685,71
TOTAL								1.468.631,00	419.608,86	151.316,70	268.292,16

³⁸ Exchange rate US\$1,00 = R\$3,50

5.5. FOCUS 5: VALUE CHAINS AND INCOME GENERATION

Threats, challenges and opportunities

The gathering of sempre-vivas flowers is economically important for local communities in the Southern Espinhaço Range (MG, Brazil). The region has become a leading exporter of ornamental plants in Minas Gerais, making a positive contribution to the State's trade balance. Although this is a traditional activity in the region, there are few studies on the value chain of sempre-vivas flowers. In fact, most of the communities have no economic organizations that could help garner a greater share in the income generated by the sale of flowers. The lack of infrastructure and the precarious transportation resources available limit their access to markets and leave the families in the hands of middlemen.

In 2018, with support from international cooperation, the Codecex commissioned a market study on the value chain of sempre-vivas flowers. That study is nearing conclusion and will provide further analysis on the economic importance of the flowers' value chain for families, particularly for women and children. The analysis will identify potential markets, unexplored opportunities and recommendations to improve profitability for sempre-vivas flowers gatherers. Initiatives such as one by a group of women in the Raiz community, who produce and market handicrafts made with sempre-vivas flowers, using social networks to disseminate their products, are options that could be enhanced to add value to products and increase the women's income. Another interesting possibility under evaluation is seeking access to fair trade markets in Brazil and abroad.

Opportunities to increase income generation go beyond gathering sempre-vivas flowers. A growing number of local communities stress the need to diversify their income-generating activities and expand their access to food markets. In addition to changing their production plans, they need to invest in food processing facilities, to leverage agroextractivism with fruit from the Cerrado and make better use of produce from their homegardens. One of the little-used opportunities lies in official procurement programs administered by municipal, State and federal governments. Although they have been in existence for years, the sempre-vivas flowers gatherers have had little access to the Food Procurement Program (PAA), launched in 2003, and the National School Food Program (PNAE), under a law from 2009.

The Codecex has been active in discussions on market access, publicizing official programs and the rights of *quilombola* communities prioritized by those programs. As a

result, since 2017 some 17 families from the Raiz community have been marketing food to the PNAE run by the Municipal Government of Presidente Kubitschek. Their experience and their dialog with Municipal Governments during the drafting of this Plan are opening doors for sempre-vivas flowers gatherers' communities to gain access to public procurement programs. The Municipal Government of Diamantina has implemented the PAA with the Mata dos Crioulos, Vargem do Inhaí and Macacos communities in 2018, as a new income-generating opportunity for many families.

Local street fairs are another little used market option. The permanent municipal markets active in Diamantina, which emphasize family farmers and handicrafts, still have no participants from the Mata dos Crioulos, Macacos or Vargem do Inhaí communities. In Buenópolis and President Kubitschek, the participation of sempre-vivas flowers gatherers is still very limited. In addition to being a chance to diversify sources of income, local markets provide visibility for the agricultural heritage system's potential to produce and supply healthy food for urban populations. By providing species and varieties from local sources of agrobiodiversity, these markets also enable the promotion and conservation of regional food culture. This strategy thus intends to carry out the following actions:

- **Action 5.1:** Development of the sempre-vivas flowers value chain.
- **Action 5.2:** Organization of the handicraft value chain.
- **Action 5.3:** Improvement of conditions for food processing and conservation.
- **Action 5.4:** Expansion of access to government procurement programs.
- **Action 5.5:** Promotion of community-based tourism.

Following are the activities planned for each action, relevant partnerships and expected outcomes. Table 5, at the end of this section, provides a timetable for implementation of the actions and the delegation of responsibilities among partner.

ACTION 5.1: Development of the sempre-vivas flowers value chain

Activities:

- a. Implement recommendations of the study on value chains of dried flowers and fruit from the Cerrado, commissioned by the Codecex in 2018.
- b. Workshops on processing sempre-vivas flowers.
- c. Set up stands for the direct sale of sempre-vivas flowers.
- d. Investments in infrastructure for marketing.

- e. Develop the products' visual identity.
- f. Participate in national and international fairs and expositions.

Implementation Strategy:

This activity will be coordinated by the Emater-MG, together with the Municipal Secretariats of Agriculture and the SEDA, with support from community organizations, the Codecex and the CAA-NM. The Municipal Governments, the Emater/MG and the SEDA/MG will provide institutional support needed to improve marketing infrastructure, for marketing and for participation in fairs and expositions.

Expected Outcomes:

- At least 30 sempre-vivas flowers gatherers trained to process and market products extracted from plants.
- At least 3 stands for direct sale installed, in each municipality covered by this plan.
- At least 3 Flowers Gatherers' Festivals organized.

ACTION 5.2: Organization of the handicraft value chain

Activities:

- a. Survey the demands of existing handicraft groups.
- b. Courses and workshops on the production of handicrafts using products extracted from plants for differentiated groups of consumers.
- c. Investments in equipment and tools to produce handicraft.
- d. Develop the visual identity of handicraft products.
- e. Produce material to publicize the handicrafts.
- f. Establish an online channel to disseminate and market handicraft, targeting domestic and overseas markets.

Implementation Strategy:

This activity will be coordinated by the SETUR, Emater-MG and Municipal Secretariats of Culture and Tourism. The Municipal Governments, SEDA, SEEDIF, SEDESE and the UEMG will provide institutional support required to improve the quality of handicrafts produced by groups of women and to facilitate their access to spaces where handicraft is marketed in the municipalities.

Expected Outcomes:

- At least 5 groups of women sempre-vivas flowers gatherers participating in courses and workshops on the production of handicrafts.
- At least 5 handicraft production groups with their own visual identity developed.
- At least one online handicraft marketing channel established and in operation.

ACTION 5.3: Improvement of conditions for food processing and conservation

Activities:

- a. Identify existing food products whose processing and conservation methods could be improved.
- b. Survey traditional food processing and conservation methods.
- c. Courses and workshops on food processing and conservation.
- d. Invest in infrastructure to process and conserve food products.
- e. Official registration and regularization of community infrastructure for food processing.

Implementation Strategy:

The action will be coordinated by Emater-MG together with the Municipal Secretariats of Agriculture, with support from community organizations. The Municipal Governments, Emater-MG and SEDA-MG will provide the institutional support needed for infrastructure investments and to regularize community enterprises.

Expected Outcomes:

- At least 30 women trained in food processing and conservation.
- At least three food processing facilities regularized and in operation.

ACTION 5.4: Expansion of access to government procurement programs

Activities:

- a. Survey available products in sempre-vivas flowers gatherers' communities and disseminate them to schools and institutional procurement managers.
- b. Expedite appropriate documentation for sempre-vivas flowers gatherers' families to gain access to institutional markets.
- c. Investments in infrastructure for transportation and sale to institutional markets.

- d. Improve the means for publicizing public calls to reach sempre-vivas flowers gatherers' communities.

Implementation Strategy:

This action will be coordinated by the Municipal Secretariats of Agriculture and Education, together with community organizations, with support from the Codecex and CAA-NM, as well as rural extension agents, for activities to plan production to meet part of the demand from institutional markets. Municipal schools and Secretariats of Education will help identify demand for the school meals program (PNAE). Municipal Governments, Emater-MG and SEDA-MG will provide institutional support needed to expand the participation of communities in government procurement and to organize local fairs and outlets to sell their goods.

Expected Outcomes:

- At least 30% of the sempre-vivas flowers gatherers' families in the six communities participating in Municipal Government's procurements for PNAE and/or PAA.

ACTION 5.5: Promotion of community-based tourism

Activities:

- a. Participatory diagnosis of potentials for community-based tourism.
- b. Exchanges with other community-based tourism initiatives.
- c. Courses and workshops to train young people in community-based tourism

Implementation Strategy:

This action will be coordinated by the Municipal Tourism Secretariats in coordination with community organizations. The Codecex, with support from the CAA-NM, will identify potential initiatives from other regions to exchange experiences in community-based tourism.

Expected Outcomes:

- At least 3 communities with surveys of the potential for community-based tourism.
- At least 20 young people trained in community-based tourism.

Table 5: Synthesis of actions, responsibilities, implementation timetable and budget

ACTIONS	Responsables		Year 1	Year 2	Year 3	Year 4	Year 5	Total R\$	Total US\$ ³⁹	Counterpart US\$	External Financing (US\$)
	Coordination	Partners									
ACTION 5.1: Development of the sempre-vivas flowser value chain	Emater-MG, SEDA, Municipal Secretariats of Agriculture	Comunity Organizations, Codecex CAA-NM		X	X	X		214.049,40	61.156,97	0,00	61.156,97
ACTION 5.2: Organization of the handicraft value chain	SETUR, Emater-MG, Municipal Secretariats of Culture and Turism.	Comunity Organizations, Codecex, SEEDIF, SEDESE, UEMG, SEDA			X			106.405,60	30.401,60	342,86	30.058,74
ACTION 5.3: Improvement of conditions for food processing and conservation	Emater-MG Municipal Secretariats of Agriculture	Comunity Organizations, CAA-NM, SEDA		X	X			369.799,20	105.656,91	0,00	105.656,91
ACTION 5.4: Expansion of access to government procurement programs	Municipal Secretariats of Agriculture and Education.	Comunity Organizations, Codecex CAA-NM, Emater-MG, SEDA	X	X	X	X	X	948.559,00	271.016,86	264.302,86	6.714,00
ACTION 5.5: Promotion of community-based tourism	Municipal Secretariats of Turism	Comunity Organizations Codecex, CAA-NM, Emater-MG			X	X		58.924,60	16.835,60	0,00	16.835,60
TOTAL								1.697.737,80	485.067,94	264.645,71	220.422,23

³⁹ Exchange rate US\$1,00 = R\$3,50

6. MONITORING AND EVALUATION OF THE DYNAMIC CONSERVATION PLAN

The city of Diamantina stands out for its historical and architectural treasures. Since 1999, it has been a UNESCO World Heritage Site. In 2005, the United Nations Educational, Scientific and Cultural Organization (UNESCO) recognized the Espinhaço Mountain Range, covering the territories where sempre-vivas flowers gatherers work, as a Biosphere Reserve.

These attractions make Diamantina a major tourism destination in Minas Gerais, and an ideal place to share with society at large the importance of the sempre-vivas flowers gatherers' agricultural heritage system. The establishment there of a physical headquarters provides a reference point to disseminate the FAO's Globally Important Agricultural Heritage Systems (GIAHS) Program, promoting awareness about the cultural value and importance of agricultural heritage systems for food and nutritional security and for the conservation of biodiversity. The initiative will add value to efforts by the Government of Diamantina and the IEPHA to promote the region's cultural heritage.

The process that gave shape to this Action Plan helped intensify partnerships between the sempre-vivas flowers gatherers, the Municipal Governments of Presidente Kubitschek and Buenópolis, the Government of the State of Minas Gerais, teaching and research institutions and civil society organizations that collaborate with the Codecex. A need became apparent, during that process, to adopt a management system that would strengthen collaborative actions among the various players committed to carrying out this Plan. To that end, this Strategy proposes the following actions:

- **Action 6.1:** Structuring of the Sempre-vivas Flowers Gatherers' GIAHS office
- **Action 6.2:** Monitoring and evaluation of the DCP

Following are the activities planned for each action, relevant partnerships and expected outcomes. Table 6, at the end of this section, provides a timetable for implementation of the actions and the delegation of responsibilities among partner organizations.

ACTION 6.1: Structuring of the Sempre-vivas Flowers Gatherers' GIAHS office

Activities:

- a. Set up the GIAHS headquarters in the Historic Center of downtown Diamantina.

- b. Negotiate with IPHAN to share a technician in Diamantina to work with immaterial heritage.
- c. Develop the GIAHS communication plan.
- d. Produce material to disseminate information about the GIAHS.

Implementation Strategy:

This action will be coordinated by the Municipal Secretariat of Culture and Heritage of the Municipality of Diamantina, in partnership with the IEPHA and Codecex.

Expected Outcomes:

- GIAHS headquarters in Diamantina established and operational
- GIAHS communication plan drafted and implemented.

ACTION 6.2: Monitoring and evaluation of the DCP

Activities:

- a. Organize the DCP Management Group, with a majority of representatives from the sempre-vivas flowers gatherers' communities.
- b. Draft and implement a participatory monitoring and assessment system for the DCP.
- c. Invest in infrastructure to improve Codecex's working conditions to monitor the DCP.
- d. Organize periodic meetings in the sempre-vivas flowers gatherers' communities to monitor and evaluate the DCP.
- e. Hold periodic meetings of the DCP Management Group to analyze outcomes of the monitoring, evaluate progress of the actions and make timely decisions on adjustments, as needed.

Implementation Strategy:

This action will be coordinated by Codecex together with organizations of sempre-vivas flowers gatherers' communities, in partnership with representatives of the City Governments of Diamantina, Presidente Kubitschek and Buenópolis and the Government of the State of Minas Gerais and other partner institutions with seats on the Management Group.

Expected Outcomes:

- DCP Management Group organized and operational.
- Timely periodic monitoring and annual evaluations of actions.

Table 2: Synthesis of actions, responsibilities, implementation timetable and budget

ACTIONS	Responsables		Year 1	Year 2	Year 3	Year 4	Year 5	Total R\$	Total US\$ ⁴⁰	Counterpart US\$	External Financing (US\$)
	Coordenation	Partners									
ACTION 6.1: Structuring of the Sempre-vivas Flowers Gatherers' GIAHS office.	Municipal Secretary of Heritage and Culture of Diamantina	Comunity Organizations, IEPHA Codecex	X	X				447.725,00	127.921,43	4.935,71	122.985,71
ACTION 6.2: Monitoring and evaluation of the DCP	Codecex Municipapal, State Government.	Comunity Organizations and partners	X	X	X	X	X	1.162.610,00	332.174,29	0,00	332.174,29
TOTAL								1.610.335,00	460.095,71	4.935,71	455.160,00

⁴⁰ Exchange rate US\$1,00 = R\$3,50

7. STRATEGIES TO FINANCE ACTIONS

Potential sources of funds for financing the actions are as follows:

- **Municipal Budgets:** The municipalities covered by this Plan do not have abundant funding, since they depend largely on transfers from the State and federal governments for their basic activities, including health and education. Brazilian law forbids them to include new spending in their budgets without specifying the funding source. Even with such limited flexibility, during the DCP timeline there is room to influence the setting of annual priorities (Budget Guidelines Law) and the Multi-Year Plan, which are federal planning tools that set priorities for four-year periods, and will be revised in 2021. Through budget adjustments, it is possible to increase matching funds, especially for actions under Focus 3, with are the responsibility of Municipal Governments.
- **State Government Budget:** In addition to the compulsory transfers required by law, the Government of the State of Minas Gerais and state-owned companies are partners with the Municipal Governments in public works for infrastructure, roads, rural powerlines, health and education facilities. By coordinating with Municipal and State authorities and the Codecex, it is possible to influence budget priorities, expanding matching funds for investments in infrastructure (Focus 3), promoting production (Focus 1), marketing (Focus 5) and Focus 4.
- **Sectoral programs run by the State and Federal Governments:** Sectoral programs are another potential source of funding for activities. Some programs are to be carried out by Municipal Governments (such as the “Internet for All” program) and others by private and/or civil-society organizations (the Million Cisterns Program, Rural Extension contracts, etc.).
- **Research contracts:** Brazil has federal and State research funding agencies that periodically publish calls to present proposals for new research projects. This is a significant source of funding, especially for actions under Focus 2.
- **International Cooperation:** The Codecex and partner NGOs are supported by international development cooperation agencies. This source will be mobilized to raise funds for actions not fundable by public-sector budgets.

8. DYNAMIC CONSERVATION PLAN MANAGEMENT SYSTEM

To draft this Plan, the Codecex met with representatives of various sectors to analyze challenges and discuss proposals to conserve the traditional agricultural system of the *sempre-vivas* flowers communities. The methodology chosen relies on creating a collaborative environment involving community organizations, Municipal Governments, various agencies of the Minas Gerais State Government, researchers and NGOs that support the Codecex. This Plan, therefore, was written by many players, but always rooted in and guided by demands raised in local communities.

The next-to-the-last workshop to draft proposals with municipal and State officials asserted the need to extend this collaboration to the management of the plan itself. Although public authorities are committed to financing many of the actions, joint efforts will be necessary among all the partners to raise additional funds. The plan, after all, is not just the sum of its parts but rather a coordinated set of actions in response to major challenges identified by stakeholders. The following points summarize the main guidelines for the plan's management system:

- **Composition of the Management Group:** The Management Group responsible for monitoring the DCP's implementation is made up of representatives from all the partners involved in its execution and will be chaired by the Codecex. Representatives from municipal and State agencies will be named by executive orders (*portarias*). Each community will name at least two representatives, ensuring gender balance. Representatives of the *sempre-vivas* flowers gatherers will occupy at least 60% of the seats in the Management Group. Decisions will preferentially be made by consensus. The bylaws of the Management Group should be approved by its second meeting, specifying rules for attendance at meetings, structure, operational procedures and other relevant issues.
- **Establish a participatory monitoring system:** The monitoring system should be spelled out during the first semester of the Plan's operations, with a light, participatory methodology that prioritizes the leading role of communities. Indicators and instruments chosen will be few in number and relevant to achieving involvement by communities and the Management Group during evaluations and decision-making on adjustments that may be necessary.
- **Transparency in managing the plan:** The Management Group's key role is to catalyze and coordinate efforts to carry out the Action Plan. Its decisions must be transparent and fully disclosed. To that end, the management system must have communication tools that enhance transparency and effective communication among all the partners, and the leading role of local communities.

ANNEXES

ANNEX 01 - Scientific references and documents

AB'SÁBER, A. N. *Os domínios de natureza no Brasil: potencialidades paisagísticas*. São Paulo: Ateliê Editorial, 2003.

ALMEIDA, A. W.B. Terras de quilombo, terras indígenas, “babaçuais livres”, “castanhais do povo”, faxinais e fundos de pasto: terras tradicionalmente ocupadas. In: Coleção “*Tradição e ordenamento jurídico*”, Manaus, AM: PPGSCA-UFAM: Fundação Ford, vol.2, 2006, p.21-99.

ALTIERI, M. A. *The ecological role of biodiversity in agroecosystems*. Agriculture, Ecosystems and Environment, v. 74, n. 1-3, p. 19-31, 1999.

ANDRADE, G. I.; RUBIO-TORGLER, H. *Sustainable use of the Tropical Rain Forest: evidence from the avifauna in a shiftingcultivation habitat mosaic in the Colombian Amazon*. Conservation Biology, v. 8, n. 2, p. 545-554, 1994.

ARAÚJO, R. W. de. *Geoambientes e Relação Solo-Vegetação no Parque Nacional das Sempre-Vivas*, Minas Gerais, Brasil. Viçosa: UFV, 2015. 106 p. (Dissertação de Mestrado)

BALÉE W. *Cultural forests of the Amazon: a historical ecology of people and their landscapes*, Tuscaloosa, AL: The University of Alabama Press. 2013. 268 p.

BOIVIN, N. L.; ZEDER, M. A.; FULLER, D. Q.; CROWTHER, A.; LARSONG, G.; ERLANDSONH, J. M.; et al. *Ecological consequences of human niche construction: Examining long-term anthropogenic shaping of global species distributions*. Proc. Natl. Acad. Sci. U.S.A. 113, p. 6388– 6396, 2016.

BOND, W. J.; KEELEY, J. E. *Fire as global ‘herbivore’: The ecology and evolution of flammable ecosystems*. Trends in Ecology and Evolution 20, p. 387–394. 2005.

BOURDIEU, P. *O desencantamento do mundo*. Coleção Elos. No. 19. São Paulo: Editora Perspectiva. 1979.

BRASIL. Constituição (1988). *Constituição da República Federativa do Brasil promulgada em 05 de outubro de 1988*. São Paulo: Thonson IOB - Editora Rio, Universidade Estácio de Sá, 2005.

BRASIL/MCTI. *Estimativas anuais de emissões de gases de efeito estufa no Brasil – 3ª edição*. Brasília: MCTI, 2016. Disponível em http://sirene.mcti.gov.br/documents/1686653/1706227/LIVRO_MCTIC_EstimativaDeGases_Publica%C3%A7%C3%A3o_210x297mm_FINAL_WEB.pdf/61e78a4d-5ebe-49cd-bd16-4ebca30ad6cd Acesso em maio de 2018.

BRASIL/MINISTÉRIO DA INTEGRAÇÃO. *Sistema Integrado de Informações de Desastres*. Disponível em <https://s2id.mi.gov.br/paginas/seriesCLAVAL>, P. Espacialidades e representações de mundo. Belo Horizonte: *GEOgrafias*, vol. 5, n.2, 2009, p.6-22. Entrevista concedida a Guilherme da Silva Ribeiro.

CARNEIRO, F.F. et al (org). *Dossiê ABRASCO: um alerta sobre os impactos dos agrotóxicos na saúde*. Rio de Janeiro: FIOCRUZ, 2015. Disponível em <http://abrasco.org.br/dossieagrototoxicos/> Acesso em maio de 2018.

CLEMENT, C. R. *1492 and the loss of Amazonian crop genetic resources. I. The relation between domestication and human population decline*. Econ. Bot. 53, p. 188–202, 1999.

CLEMENT, C. R.; DENEVAN, W. M.; HECKENBERGER, M. J.; JUNQUEIRA, A. B.; NEVES, E. G.; TEIXEIRA, W. G.; et al. *The domestication of Amazonia before European conquest*. Proc. R Soc. B, 2015. 282p.

COMIG e IGC/UFMG. *Projeto Espinhaço*. Belo Horizonte/MG, 1997, 2693p. (CD-ROM).

COSTA, C.M.R.; HERRMANN, G.; MARTINS, C.S.; LINS, L.V.; e LAMAS, I.R.. (Org.). *Biodiversidade em Minas Gerais: Um Atlas para sua Conservação*. 1ª. ed., Belo Horizonte: Fundação Biodiversitas, 1998.

- COSTA, F. N. Campos Rupestres. In: SILVA, A., C.; PEDREIRA, L. C. V. S. F. e ABREU, P.A. . (Org.). *Serra do Espinhaço Meridional: paisagens e ambientes*. Belo Horizonte: O Lutador, 2005, p. 139-145.
- COUTINHO, L.M. *Aspectos ecológicos do fogo no cerrado: nota sobre a ocorrência e datação de carvões encontrados no interior de solo sob cerrado*. Revista Brasileira de Botânica, v.4, p.115-117, 1981.
- COSTA FILHO, A. *Relatório-Diagnóstico sobre as comunidades tradicionais das imediações e dentro do Parque Nacional das Sempre-vivas*. Belo Horizonte: GESTA/FAFICH – UFMG, 2014. 55p.
- CUNHA, M. C. *Negros, Estrangeiros: Os escravos libertos e sua volta à África*. São Paulo: Brasiliense, 1985.
- DUMONT, Louis. *O Individualismo: uma perspectiva antropológica da ideologia moderna*. Rio de Janeiro: Rocco, 1985.
- DURIGAN, G.; RATTER, J. A. *The need for a consistent fire policy for Cerrado conservation*. Journal of Applied Ecology, 2016.
- DURKHEIM, É. *As formas elementares da vida religiosa: o sistema totêmico na Austrália*. São Paulo: Martins Fontes, 1996.
- FRIZANO, J.; VANN, D. R.; JOHNSON, A. H.; JOHNSON, C. M.; VIEIRA, I. C. G.; ZARIN, D. J. *Labile Phosphorus in Soils of Forest Fallows and Primary Forest in the Bragantina Region, Brazil*. Biotrópica, v. 35, p. 2-11, 2003.
- GLASER, B.; BIRK J. J. *State of the scientific knowledge on properties and genesis of anthropogenic dark earths in Central Amazonia (terra preta de Índio)*. Geochim. Cosmochim. Acta 82, p. 39–51, 2012.
- GONTIJO, B.M. Uma geografia para a Cadeia do Espinhaço. In: *Megadiversidade - Cadeia do Espinhaço: avaliação do conhecimento científico e prioridades de conservação*. Belo Horizonte: Conservation International, vol. 4, n. 12, 2008, p. 7-16.
- GUPTA, A. K. *Shifting cultivation and conservation of biological diversity in Tripura, Northeast India*. Human Ecology, v. 28, n. 4, p. 605-629, 2000.
- HEIDRICH, A.L. Conflitos territoriais na estratégia de preservação da natureza. In: SAQUET, M.A. e SPOSITO, E.S. (Org.) *Território e territorialidades: teorias, processos e conflitos*. São Paulo: Expressão Popular, 2009, p. 271-290.
- HEREDIA, B. & GARCIA Jr, A. Trabalho familiar e campesinato. *América Latina 14* (1/2), 1971.
- HEREDIA, B. *A Morada da Vida. Trabalho familiar de pequenos produtores do Nordeste do Brasil*. Rio de Janeiro: Paz e Terra, 1979.
- HOMMA, A. K. O.; WALKER, R. T.; SCATENA, F. N.; COUTO, A. J.; CARVALHO, R. A.; FERREIRA, C. A. P.; SANTOS, A. I. M. Redução dos desmatamentos na Amazônia: política agrícola ou ambiental. In: HOMMA, A. K. O. *Amazônia: meio ambiente e desenvolvimento agrícola*. Brasília: Editora Embrapa-SPI, p. 119-141, 1998.
- ISNARDIS, A. Entre as Pedras: as ocupações pré-históricas recentes e os grafismos rupestres da região de Diamantina, Minas Gerais. *Revista do Museu de Arqueologia e Etnologia da USP*. Suplemento 10. São Paulo: Universidade de São Paulo, 2009.
- JOHNSON, C. M.; VIEIRA, I. C. G.; ZARIN, D. J.; FRIZANO, J.; JOHNSON, A. H. *Carbon and nutrient storage in primary and secondary forests in eastern Amazonia*. Forest Ecology and Management, v. 147, n. 2, p. 245-252, 2001.
- LALAND, K.N.; ODLING-SMEE, F.J.; FELDMAN, M.W. *On the evolutionary consequences of Niche construction*. J. Evol. Biol. 9: p. 293–316, 1996.
- LEACH, E. R. *Sistemas políticos da Alta Birmânia*. São Paulo: Edusp. 1996.

- LEHMANN, C. E. R. *et al.* *Savanna vegetation-fire-climate relationships differ among continents*. Science. v. 343, n. 6.170, p. 548-52, 2014.
- LEHMANN, C. E.; ARCHIBALD, S. A.; HOFFMANN, W. A., Bond, W. J. *Deciphering the distribution of the savanna biome*. New Phytol. 191, 197, 2011.
- LEVIS, C.; FLORES, B. M.; MOREIRA, P. A.; LUIZE, B. G.; ALVES, R. P.; MORAES, J. F.; LINS, J.; KONINGS, E.; CLAROS, M. P.; BONGERS, F. COSTA, F. R. C.; CLEMENT, C. R. *How People Domesticated Amazonian Forests*. Frontiers in Ecology and Evolution. v. 5, 2018. 171p.
- LITTLE, Paul E. Territórios sociais e povos tradicionais no Brasil: por uma antropologia da territorialidade. *Série Antropologia*. N° 322. Brasília: DAN/UnB, 2002.
- MENDRAS, Henri. *Sociedades Camponesas*. Rio de Janeiro: Jorge Zahar, 1978.
- MACHADO FILHO, A. M. *Arraial do Tijuco: cidade Diamantina*. Belo Horizonte: Itatiaia, 1980.
- MAINGUENEAU, D. *Novas tendências em Análise do Discurso*. São Paulo: Pontes, 1989.
- MAZOYER, M.; ROUDART, L. *Histórias das agriculturas no mundo: do neolítico à crise contemporânea*. São Paulo: UNESP; Brasília: NEAD, 2010.
- MCGRATH, D. G. *The role of biomass in shifting cultivation*. Human Ecology, v. 15, n. 2, p. 221-242, 1987.
- MIRANDA, H.S.; SATO, M.N.; Neto W.N.; AIRES, F.S. (2009) Fires in the cerrado, the Brazilian savanna. In: *Tropical Fire Ecology*. Springer Praxis Books. Springer, Berlin, Heidelberg Tropical fire ecology H. S. Miranda, M. N. Sato, W. N. Neto, F. S. Aires, 2009.
- MONTEIRO, F. T. *Os(as) apanhadores(as) de flores e o Parque Nacional das Sempre-vivas (MG): travessias e contradições ambientais*. Belo Horizonte: UFMG, 2011. 240p. (Dissertação de Mestrado).
- NAC/UFVJM – Núcleo de Estudos em Agroecologia e Campesinato da UFVJM. *Caraterização e Análise do Agroecossistema da família de Preta e Imir, Comunidade de Vargem do Inhaí - Diamantina - Alto Jequitinhonha*. Diamantina: NAC/UFVJM, 2015. 26p.
- NAC/UFVJM – Núcleo de Estudos em Agroecologia e Campesinato da UFVJM. *Sistemas Agroecológicos e Inovações Tecnológicas na Região do Semiárido de Minas Gerais*. Diamantina: NAC/UFVJM, 2016. 28p.
- NAC/UFVJM – Núcleo de Estudos em Agroecologia e Campesinato da UFVJM. *Monitoramento de Agroecossistemas de Referência Agroecológica na Região do Semiárido de Minas Gerais - Ciclo de Monitoramento 2015/2016 - Agroecossistema da família de Preta e Imir, Comunidade de Vargem do Inhaí, Diamantina, Alto Jequitinhonha*. Diamantina: NAC/UFVJM, 2017. 8p.
- NAC/UFVJM – Núcleo de Estudos em Agroecologia e Campesinato da UFVJM. *Atualização da Caraterização do Agroecossistema da família de Preta e Imir, Comunidade de Vargem do Inhaí - Diamantina - Alto Jequitinhonha*. Diamantina: NAC/UFVJM, 2019. 27p.
- NESFV/UFVJM – Núcleo de Ecofisiologia Vegetal da UFVJM. *Sempre-vivas coletadas em Minas Gerais e épocas de coleta*. Diamantina: NESFV/UFVJM, 2018. 41p.
- NEVES, W. Sociodiversity and biodiversity, two sides of the same equation. In: CLUSENER-GODT, M. & SACHS, I. (Eds.). *Brazilian perspectives on sustainable development of the Amazon Region*. Paris: The Panteon Publishing Group, p. 91-124, 1995. (Man and the Biosphere Series).
- ODLING-SMEE, F.J. *Niche construction, genetic evolution and cultural change*. Behav. Processes 35, p. 195–205, 1996.
- OLIVEIRA, M.N. S. de.; TANAKA, M. K.; MOREIRA, F.C. *Sempre-vivas: aspectos do manejo e do cultivo*. Diamantina: UFVJM, 2012. 65p.
- OLIVEIRA, R. R. *When the shifting agriculture is gone: functionality of Atlantic Coastal Forest in abandoned farming sites*. Boletim do Museu Paraense Emílio Goeldi. Ciências Humanas, v.3, n.2, p. 56-72, 2008.

- PAUSAS, J. G.; KEELEY, J. E. *A Burning Story: The Role of Fire in the History of Life*. *BioScience* 59(7), p. 593-601. 2009.
- PEDROSO JÚNIOR, N. N.; MURRIETA, R. S. S.; ADAMS, C. *A agricultura de corte e queima: um sistema em transformação*. Belém: Bol. Mus. Para. Emílio Goeldi. Ciências Humanas, v. 3, n. 2, p. 153-174, 2008.
- PINHEIRO, M. H. O. *Formações savânicas mundiais: uma breve descrição fitogeográfica*. *Brazilian Geographical Journal: Geosciences and Humanities research medium, Uberlândia*, v. 1, n. 2, p. 306-313, 2010.
- PINHEIRO, M. H. O.; MONTEIRO, R. *Contribution to the discussions on the origin of the cerrado biome: Brazilian savanna*. *Braz. J. Biol.*, vol. 70, no. 1, p. 95-102, 2010.
- RAMAN, T. R. S. *Effect of Slash-and-Burn Shifting Cultivation on Rainforest Birds in Mizoram, Northeast India*. *Conservation Biology*, v. 15, n. 3, p. 685-698, 2001.
- RAMOS-NETO, B.; PIVELLO, R. *Lightning Fires in a Brazilian Savanna National Park: Rethinking Management Strategies*. *Environmental Management* Vol. 26, No. 6, p. 675–684, 2000.
- RIBEIRO, A. E. M. As histórias dos gerais. In: Aureo Eduardo M. Ribeiro. (Org.). *Histórias dos gerais*. Belo Horizonte: UFMG, v. 1, 2010, p. 23-42.
- RIBEIRO, R. F. *Florestas anãs do Sertão - o Cerrado na História de Minas Gerais*. Belo Horizonte: Autêntica, 2005.
- RIZZINI, C. T. *Tratado de fitogeografia no Brasil*, 1997.
- ROSS, N. J. *Modern tree species composition reflects ancient Maya "forest gardens" in northwest Belize*. *Ecol. Appl.* 21, 75-84, 2011.
- SAADI, A. A geomorfologia da Serra do Espinhaço em Minas Gerais e de suas margens. In: *Geonomos*, vol. 3, n. 1, 1995, p. 41-63.
- SAINT-HILAIRE, A. de. *Viagem pelo Distrito dos Diamantes e litoral do Brasil* (Paris, 1833). Tradução de Leonam de Azeredo Penna. Belo Horizonte: Itatiaia, 2004.
- SEYFERTH, G. *Herança e Estrutura Familiar Camponesa*. *Boletim do Museu Nacional* 59, 1985.
- STAVER, C.; ARCHIBALD, S.; LEVIN, S. *Tree cover in sub-Saharan Africa: Rainfall and fire constrain forest and savanna as alternative stable states*. *Ecology* 92, 1063, 2011.
- STAVER, C.; ARCHIBALD, S.; LEVIN, S. *The Global Extent and Determinants of Savanna and Forest as Alternative Biome States* 2011.
- SCHMIDT, I. B.; MOURA MAXMILLER, L.C. C.; FERREIRA, L.; SAMPAIO, E.; DIAS, C.N. *Berlinck. Fire management in the Brazilian savanna: First steps and the way forward*. *Journal of Applied Ecology*. 2018.
- UFVJM; PUC-MG; PMD; EMATER-MG; IDENE. *Encontro de atores da cadeia do extrativismo vegetal da Serra do Espinhaço*. Diamantina/MG, 2009, 46p. (Relatório).
- WILLIS, K. J.; GILLSON, L.; BRNCIC, T. M. *How " virgin " is virgin rainforest?* *Science*, 304, p. 402–403, 2004.
- WOLF, Eric. Tipos de campesinato latino-americano: uma discussão preliminar. Bela Feldman-Bianco & Gustavo Lins Ribeiro (Orgs). *Antropologia e Poder*. Brasília/São Paulo: Ed.Unb/Ed.Unicamp, 2003. Pgs. 117-144.
- WOORTMANN, Ellen F. *Herdeiros, Parentes e Compadres*. Brasília: Hucitec/EdUNB, 1995.
- WOORTMANN, Klaas. *Com parente não se Neguceia. Série Antropologia*. Nº 69. Brasília: UnB/Dep. Antropologia. 1986.

ANEXO 02 – LIST OF SPECIES

Food species grown in crop fields and homegardens

<i>Abelmoschus esculentus</i> (L.) Moench	Malvaceae
<i>Allium cepa</i> L.	Amaryllidaceae
<i>Allium fistulosum</i> L.	Liliaceae
<i>Anacardium occidentale</i> L.	Anacardiaceae
<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae
<i>Annona squamosa</i> L.	Annonaceae
<i>Arachis hypogaea</i> L.	Fabaceae
<i>Arracacia xanthorrhiza</i> Bancr.	Apiaceae
<i>Artocarpus heterophyllus</i> Lam.	Moraceae
<i>Beta vulgaris</i> L.	Amaranthaceae
<i>Beta vulgaris</i> L. subsp. <i>vulgaris</i>	Brassicaceae
<i>Brassica oleracea</i> L.	Brassicaceae
<i>Brassica oleracea</i> var. <i>capitata</i>	Brassicaceae
<i>Cajanus cajan</i> (L.) Millsp.	Fabaceae
<i>Capsicum annuum</i> L.	Solanaceae
<i>Capsicum frutescens</i> L.	Solanaceae
<i>Capsicum</i> sp.	Solanaceae
<i>Carica papaya</i> L.	Caricaceae
<i>Cichorium intybus</i> L.	Asteraceae
<i>Cichorium</i> sp.	Asteraceae
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Cucurbitaceae
<i>Citrus</i> cf. <i>deliciosa</i> Ten.	Rutaceae
<i>Citrus</i> cf. <i>sinensis</i> (L.) Osbeck	Rutaceae
<i>Citrus</i> cf. <i>sinensis</i> (L.) Osbeck	Rutaceae
<i>Citrus limon</i> (L.) Osbeck	Rutaceae
<i>Citrus limonia</i> (L.) Osbeck	Rutaceae
<i>Citrus reticulata</i> L.	Rutaceae
<i>Cocus nucifera</i> L.	Arecaceae
<i>Coffea arabica</i> L.	Rubiaceae
<i>Colocasia esculenta</i> (L.) Schott	Araceae
<i>Coriandrum sativum</i> L.	Apiaceae
<i>Cucumis anguria</i> L.	Cucurbitaceae
<i>Cucurbita</i> sp.1	Cucurbitaceae
<i>Cydonia oblonga</i> Mill.	Rosaceae
<i>Daucus carota</i> L.	Apiaceae
<i>Dioscorea bulbifera</i> L.	Dioscoreaceae
<i>Dioscorea trifida</i> L.	Dioscoraceae
<i>Eriobotrya japonica</i> (Thunb.) Lindl.	Rosaceae
<i>Eugenia uniflora</i> L.	Myrtaceae
<i>Hibiscus</i> sp.	Malvaceae
<i>Ipomoea batatas</i> (L.) Lam.	Solanaceae

<i>Lablab purpureus</i> (L.) Sweet	Fabaceae
<i>Lactuca sativa</i> L.	Asteraceae
<i>Lagenaria siceraria</i> (Molina) Standl.	Cucurbitaceae
<i>Lagenaria</i> sp.	Cucurbitaceae
<i>Malpighia emarginata</i> L.	Malpighiaceae
<i>Mangifera indica</i> L.	Anacardiaceae
<i>Manihot esculenta</i> Crantz	Euphorbiaceae
<i>Manihot</i> sp.	Euphorbiaceae
<i>Morus nigra</i> L.	Moraceae
<i>Musa</i> × <i>paradisica</i> L.	Musaceae
<i>Myrciaria cauliflora</i> (Mart.) O. Berg	Myrtaceae
<i>Nasturtium officinale</i> R. Br.	Brassicaceae
<i>Passiflora edulis</i> L.	Passifloriaceae
<i>Penisetum</i> sp.	Poaceae
<i>Pereskia aculeata</i> Miller	Cactaceae
<i>Persea americana</i> Mill.	Lauraceae
<i>Petroselinum crispum</i> (Mill.) Nym	Apiaceae
<i>Phaseolus lunatus</i> L.	Fabaceae
<i>Phaseolus vulgaris</i> L.	Fabaceae
<i>Phaseolus vulgaris</i> L.	Fabaceae
<i>Pisum sativum</i> L.	Fabaceae
<i>Prunus persica</i> (L.) Batsch	Rosaceae
<i>Psidium guajava</i> L.	Myrtaceae
<i>Punica granatum</i> L.	Lythraceae
<i>Saccharum officinarum</i> L.	Poaceae
<i>Sechium edule</i> (Jacq.) Sw.	Cucurbitaceae
<i>Sinapis alba</i> L.	Brassicaceae
<i>Solanum aethiopicum</i> L.	Solanaceae
<i>Solanum lycopersicum</i> L.	Solanaceae
<i>Solanum tuberosum</i> L.	Solanaceae
<i>Spinacia oleracea</i> L.	Amaranthaceae
<i>Vigna unguiculata</i> (L.) Walp.	Fabaceae
<i>Vitis vinifera</i> L.	Vitaceae
<i>Xanthosoma sagittifolium</i> (L.) Schott	Areaceae
<i>Zea mays</i> L.	Poaceae

Cultivated medicinal and spice species

Scientific name	Botanic family
<i>Allium sativum</i> L.	Amaryllidaceae
<i>Artemisia absinthium</i> L.	Asteraceae
<i>Artemisia vulgaris</i> L.	Asteraceae
<i>Bixa orellana</i> L.	Bixaceae
<i>Foeniculum vulgare</i> Mill.	Apiaceae
<i>Lavandula angustifolia</i> Mill.	Lamiaceae

<i>Melissa officinalis</i> L.	Lamiaceae
<i>Mentha × villosa</i> Huds.	Lamiaceae
<i>Mentha pulegium</i> L.	Lamiaceae
<i>Nicotiana tabacum</i> L.	Solanaceae
<i>Ocimum basilicum</i> L.	Lamiaceae
<i>Origanum majorana</i> L.	Lamiaceae
<i>Phyllanthus niruri</i> L.	Phyllanthaceae
<i>Pimpinella anisum</i> L.	Apiaceae
<i>Plantago major</i> L.	Plantaginaceae
<i>Rosmarinus officinalis</i> L.	Lamiaceae
<i>Ruta graveolens</i> L.	Rutaceae

Identified native food species

Scientif name	Botanic family
<i>Amaranthus viridis</i> L.	Amaranthaceae
<i>Atalea</i> sp.	Arecaceae
<i>Atalea</i> sp.	Arecaceae
<i>Atalea</i> sp.	Arecaceae
<i>Cecropia</i> sp.	Urticaceae
<i>Cipocereus minensis</i> (Werderm.) F. Ritter	Cactaceae
<i>Erechtites cf. valerianifolius</i> (Link ex Spreng.) DC.	Asteraceae
<i>Melocactus zehntneri</i> (Britton & Rose) Luetzelburg	Cactaceae
<i>Pilosocereus aurisetus</i> (Werderm.) Byles & G.D. Rowley	Cactaceae
<i>Portulaca oleracea</i> L.	Portulacaceae
<i>Pteridium aquilinum</i> (L.) Kuhn	Dennstaedtiaceae
<i>Sonchus oleraceus</i> L.	Asteraceae
<i>Syagrus coronata</i> (Martius) Beccari	Arecaceae

Identified native medicinal and spice species

Scientific name	Botanic family
<i>Alibertia edulis</i> (L.C. Rich.) A.C. Rich.	Rubiaceae
<i>Aloe vera</i> (L.) Burm. f.	Asphodelaceae
<i>Astronium fraxinifolium</i> Schott	Anacardiaceae
<i>Baccharis trimera</i> (Less.) DC.	Asteraceae
<i>Brugmansia</i> sp.	Solanaceae
cf. <i>Rudgea viburnoides</i> (Cham.) Benth.	Rubiaceae
<i>Coutarea</i> sp.	Rubiaceae
<i>Croton</i> sp.	Euphorbiaceae
<i>Dorstenia brasiliensis</i> Lam.	Moraceae
<i>Dysphania ambrosioides</i> (L.) Mosyakin & Clemants	Amaranthaceae

<i>Echinodorus grandiflorus</i> (Cham. & Schltldl.) Micheli	Alismataceae
<i>Handroanthus avellanadae</i> (Lorentz ex Griseb.) Mattos	Bignoniaceae
<i>Jacaranda decurrens</i> Cham.	Bignoniaceae
<i>Lafoensia pacari</i> A. St.-Hil.	Lythraceae
<i>Lychnophora ericoides</i> Mart.	Asteraceae
<i>Mabeae</i> sp.	Clusiaceae
<i>Miconia albicans</i> (Sw.) Steud.	Melastomataceae
<i>Mimosa tenuiflora</i> (Willd.) Poir.	Fabaceae
<i>Mouriri</i> sp.	Melastomataceae
<i>Nectandra</i> sp.	Lauraceae
<i>Periandra</i> sp.	Fabaceae
<i>Pterodon emarginatus</i> Vogel	Fabaceae
<i>Sabicea brasiliensis</i> Wernham	Rubiaceae
<i>Simaba ferruginea</i> A. St.-Hil.	Simaroubaceae
<i>Similax</i> sp.	Smilacaceae
<i>Stryphnodendron adstringens</i> (Mart.) Coville	Fabaceae
<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae

Identified species of managed native edible fruits

Scientif name	Botanic Family
<i>Anana</i> sp.	Bromeliaceae
<i>Psidium</i> sp.	Myrtaceae
<i>Psidium</i> cf. <i>cattleyanum</i> Sabine	Myrtaceae
<i>Annona crassiflora</i> Mart.	Annonaceae
<i>Annona</i> sp.	Annonaceae
<i>Dipteryx alata</i> Vogel	Fabaceae
<i>Stenocalyx dysentericus</i> (DC.) O. Berg	Myrtaceae
<i>Anacardium humile</i> Engl.	Anacardiaceae
<i>Syagrus</i> sp.	Arecaceae
<i>Butia capitata</i> (Mart.) Becc.	Arecaceae
<i>Pseudobombax</i> sp.	Malvaceae
<i>Bauhinia</i> sp.	Fabaceae
<i>Campomanesia xanthocarpa</i> Mart. ex O. Berg	Myrtaceae
<i>Pouteria ramiflora</i> (Mart.) Radlk.	Sapotaceae
<i>Inga</i> sp1.	Fabaceae
<i>Inga</i> sp2.	Fabaceae
<i>Myrciaria</i> sp.	Myrtaceae
<i>Syzygium jambos</i> (L.) Alston	Myrtaceae
<i>Hymenaea stigonocarpa</i> Mart. ex Hayne	Fabaceae
<i>Hymenaea</i> sp.	Fabaceae
<i>Hymenaea courbaril</i> L.	Fabaceae

<i>Genipa americana</i> L.	Rubiaceae
<i>Tocoyena formosa</i> (Cham. & Schltld.) K. Schum.	Rubiaceae
<i>Hancornia speciosa</i> Gomes	Apocynaceae
<i>Passiflora</i> sp.	Passifloriaceae
<i>Alibertia edulis</i> (L.C. Rich.) A.C. Rich.	Rubiaceae
<i>Byrsonima</i> sp.1	Malpighiaceae
<i>Byrsonima</i> sp.2	Malpighiaceae
<i>Byrsonima crassifolia</i> (L.) Rich.	Malpighiaceae
<i>Caryocar brasiliense</i> Cambess.	Caryocaraceae
<i>Xylopiya aromatica</i> (Lam.) Mart.	Annonaceae
<i>Talisia acutifolia</i> Radlk.	Sapindaceae
<i>Manilkara zapota</i> (L.) P.Royen	Sapotaceae

Identified species of managed timber

Scientific name	Botanic family
<i>Aspidosperma</i> sp.	Apocynaceae
<i>Copaifera langsdorffii</i> Desf.	Fabaceae
<i>Eremanthus erythropappus</i> (DC.) MacLeish	Asteraceae
<i>Handroanthus chrysotrichus</i> (Mart. ex A. DC.) Mattos	Bignoniaceae
<i>Handroanthus</i> sp.	Bignoniaceae
<i>Magonia pubescens</i> A. St.-Hil.	Sapindaceae
<i>Myracrodruon urundeuva</i> Allemão	Anacardiaceae
<i>Plathymenia reticulata</i> Benth.	Fabaceae
<i>Pseudobombax</i> sp.	Malvaceae
<i>Pterodon</i> cf. <i>emarginatus</i> Vogel	Fabaceae
<i>Xylopiya</i> sp.	Annonaceae

Species of animals raised

Scientific name
<i>Apis mellifera</i>
<i>Apis mellifera</i>
<i>Apis mellifera</i>
<i>Bos taurus</i>
<i>Bosass primigenius taurus</i>
<i>Equus asinus</i> × <i>Equus caballus</i>
<i>Equus caballus</i>
<i>Gallus gallus domesticus</i>
<i>Meleagris gallopavo</i>
<i>Melipona quadrifasciata</i>
<i>Numida meleagris</i>
<i>Oryctolagus cuniculus</i>

<i>Plebeia droryana</i>
<i>Scaura longula</i>
<i>Sus scrofa domesticus</i>
<i>Tetragonisca angustula</i>

Below identified ornamental species (*other ornamental species are still being identified by botanists)

Identified species of everglasting flowers ("daisy-like" inflorescence)

Scientific name	Botanic family
<i>Comanthera aciphylla</i> (Bong.) Ruhland	Eriocaulaceae
<i>Comanthera aff. ruprechtiana</i> (Koern.) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera bisulcata</i> (Koern.) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera bisulcata</i> (Koern.) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera bisulcata</i> (Koern.) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera brasiliiana</i> (Giul.) L.R. Parra & Giul.	Eriocaulaceae
<i>Comanthera brunnea</i> Echtertn.	Eriocaulaceae
<i>Comanthera dealbata</i> (Silveira) L.R.Parra Giul	Eriocaulaceae
<i>Comanthera dealbata</i> (Silveira) L.R.Parra Giul.	Eriocaulaceae
<i>Comanthera dealbata</i> (Silveira) L.R.Parra Giul.	Eriocaulaceae
<i>Comanthera elegans</i> (Bong.) Ruhland var. <i>elegans</i>	Eriocaulaceae
<i>Comanthera elegantula</i> (Silveira) L.R.Parra Giul.	Eriocaulaceae
<i>Comanthera magnifica</i> (Giul.) L.R. Parra & Giul.	Eriocaulaceae
<i>Comanthera nitida</i> (Bong.) Ruhland	Eriocaulaceae

<i>Comanthera nitida</i> (Bong.) Ruhland	Eriocaulaceae
<i>Comanthera nitida</i> (Bong.) Ruhland	Eriocaulaceae
<i>Comanthera paepalophylla</i> (Silveira) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera ruprechtiana</i> (Koern.) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera suberosa</i> (Giul.) L.R. Parra & Giul.	Eriocaulaceae
<i>Syngonanthus aff. anthemidiflorus</i> var. <i>similis</i> (Ruhland) L.R.Parra & Giul.	Eriocaulaceae
<i>Syngonanthus itambeensis</i> Silveira	Eriocaulaceae
<i>Syngonanthus laricifolius</i> (Gardn.) Ruhland	Eriocaulaceae
<i>Syngonanthus multipes</i> Silveira	Eriocaulaceae

Identified species of "buds" ("bud"-type inflorescences)

Scientif name	Botanic family
<i>Abolboda poarchon</i> Seub	Xyridaceae
<i>Actinocephalus polyanthus</i> (Bong.) Kunth	Eriocaulaceae
<i>Bulbostylis</i> sp	Cyperaceae
<i>Cephalostemum riedelianus</i> Koern	Rapateaceae
<i>Comanthera centauroides</i> (Bong.) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera vernonioides</i> var. <i>vernonioides</i> Silveira	Eriocaulaceae
<i>Comanthera vernonioides</i> (Kunth) L.R.Parra & Giul.	Eriocaulaceae
<i>Comanthera vernonioides</i> var. <i>melanolepis</i> Silveira	Eriocaulaceae
<i>Eriocaulon ligulatum</i> (Vell.) L.B.Sm. <i>Eriocaulon elichrysoides</i>	Eriocaulaceae

<i>Gomphrena</i> sp.	Amaranthaceae
<i>Leiothrix argentea</i> Silveira	Eriocaulaceae
<i>Leiothrix</i> cf. <i>polystemma</i> Silveira	Eriocaulaceae
<i>Leiothrix curvifolia</i> (Bong.) Ruhland	Eriocaulaceae
<i>Leiothrix flavescens</i> (Bong.) Ruhland	Eriocaulaceae
<i>Leiothrix propinqua</i> (Koern.) Ruhland	Eriocaulaceae
<i>Leiothrix rupestris</i> Giul.	Eriocaulaceae
<i>Paepalanthus chrysolepis</i> Silveira	Eriocaulaceae
<i>Paepalanthus comans</i> Silveira	Eriocaulaceae
<i>Paepalanthus flavorutilus</i> Ruhland	Eriocaulaceae
<i>Paepalanthus giganteus</i> Sano	Eriocaulaceae
<i>Paepalanthus incanus</i> Koern.	Eriocaulaceae
<i>Paepalanthus incanus</i> Koern.	Eriocaulaceae
<i>Paepalanthus macrocephalus</i> (Bong.) Koern.	Eriocaulaceae
<i>Paepalanthus macrocephalus</i> Koern.	Eriocaulaceae
<i>Paepalanthus planifolius</i>	Eriocaulaceae
<i>Paepalanthus pubescens</i> Koern.	Eriocaulaceae
<i>Paepalanthus pubescens</i> Koern.	Eriocaulaceae
<i>Paepalanthus regalis</i> Mart.	Eriocaulaceae
<i>Paepalanthus rhizomatosus</i> Silveira	Eriocaulaceae
<i>Rhynchospora globosa</i> (H.B.K.) Koern. & Schult.	Cyperaceae
<i>Rhynchospora speciosa</i> (Kunth) Boeck.	Cyperaceae
<i>Syngonanthus arenarius</i> (Gardn.) Ruhland	Eriocaulaceae
<i>Syngonanthus caulescens</i> (Poir.) Rhuland	Eriocaulaceae
<i>Syngonanthus elongatus</i>	Eriocaulaceae
<i>Syngonanthus helmintorrhizuz</i> (Mart.)	Eriocaulaceae

Ruhland	
<i>Syngonanthus macrolepis</i> Silveira	Eriocaulaceae
<i>Syngonanthus niger</i> Silveira	Eriocaulaceae
<i>Syngonanthus niger</i> Silveira	Eriocaulaceae
<i>Syngonanthus nitens</i> (Bong.) Ruhland	Eriocaulaceae
<i>Xyris asperula</i> Mat/Seub	Xyridaceae
<i>Xyris aurea</i> L. B. Smith & Downs	Xyridaceae
<i>Xyris bialata</i> Malme	Xyridaceae
<i>Xyris calostachys</i> Paulse ex Warrm	Xyridaceae
<i>Xyris cipoensis</i> L. B. Sm. & Downs	Xyridaceae
<i>Xyris coutensis</i> Wand. & Cerati	Xyridaceae
<i>Xyris hymenachne</i> Mart.	Xyridaceae
<i>Xyris insignis</i> L. A. Nilsson	Xyridaceae
<i>Xyris longiscapa</i> Alb. Nilsson	Xyridaceae
<i>Xyris melanopoda</i> L. B. Sm. & Down	Xyridaceae
<i>Xyris peregrina</i> Malme	Xyridaceae
<i>Xyris pilosa</i> Kunth.	Xyridaceae
<i>Xyris platystachya</i> Alb. Nilson	Xyridaceae
<i>Xyris pterygoblephara</i>	Xyridaceae
<i>Xyris pterygoblephara</i>	Xyridaceae
<i>Xyris roraimae</i> Malme	Xyridaceae
<i>Xyris schizachne</i> Mart.	Xyridaceae
<i>Xyris</i> sp.	Xyridaceae
<i>Xyris sparcifolia</i> Kral & L. B. Smith	Xyridaceae
<i>Xyris spectabilis</i> Mart	Xyridaceae
<i>Xyris trachyphylla</i>	Xyridaceae

Identified species of dry fruits

Scientif name	Botanic family
<i>Acrocomia aculeata</i>	Arecaceae
<i>Adenanthera pavonina</i>	Fabaceae
<i>Anadenanthera macrocarpa</i>	Mimosoideae
<i>Anadenanthera</i> sp.	Mimosoideae
<i>Anadenanthera</i> sp.	-
<i>Apeiba tibourbou</i>	Malvaceae
<i>Apeiba tibourbou</i> Aubl.	Malvaceae
<i>Aspidosperma ramiflorum</i> M. Arg	Apocynaceae
<i>Aspidosperma macrocarpon</i>	Apocynaceae
<i>Aspidosperma subincanum</i>	Apocynaceae
<i>Aspidosperma Subincanum</i> Mart.	Apocynaceae
<i>Aspidosperma tomentosum</i>	Apocynaceae
<i>Aspidsperma pyriformium</i>	Apocynaceae
<i>Blepharocaly salicifolius</i>	Myrtaceae
<i>Calophyllum brasiliense</i>	Clusiaceae
<i>Calotropis procera</i>	Asclepiadaceae
<i>Canavalia ensiformes</i>	Fabaceae
<i>Cariniana estrellensis</i>	Lecythidaceae
<i>Delonix regia</i>	Fabaceae
<i>Dipteryx alata</i>	Papilinoideae
<i>Dyospiros hispida</i>	Fabaceae
<i>Endopleura uchi</i>	Humiriaceae
<i>Enterolobium contortisiliquum</i>	Mimosodeae
<i>Entorolobium gummiferum</i>	
<i>Esenbeckia grandiflora</i>	Rutaceae
<i>Eugenia dysenterica</i>	Myrtaceae

<i>Guazuma ulmifolia</i>	Malvaceae
<i>Haplolophium</i> sp.	Bignoniaceae
<i>Himatanthus obovatus</i>	Apocynaceae
<i>Hymenaea stignocarpa</i>	Caesalpinioideae
<i>Jacaranda puberula</i>	Bignoniaceae
<i>Jacaranda ulei</i>	Bignoniaceae
<i>Jacaranda brasiliana</i>	Bignoniaceae
<i>Kielmeyera coriacea</i>	Clusiaceae
<i>Kielmeyera Lathrophytum Saddi</i>	Clusiaceae
<i>Lecythis pisonis</i>	Lecythidaceae
<i>Luehea grandiflora</i>	Malvaceae
<i>Luehea</i> sp.	-
<i>Luehera divoricata</i>	Tiliaceae
<i>Magonia pubescens</i>	Sapindaceae
<i>Magonia pubescens</i>	Sapindaceae
<i>Mauritia flexuosa</i>	Arecaceae
<i>Mauritia flexuosa</i>	Arecaceae
<i>Mucuna pruriens</i>	-
<i>Stizolobium aterrimum</i>	
<i>Odontadenia lutea</i>	Apocynaceae
<i>Ormosia fastigiata</i>	Papilinoideae
<i>Osmosia</i> sp.	-
<i>Pithecoctenium crucigerum</i>	Bignoniaceae
<i>Qualea cordata</i>	Vochysiaceae
<i>Qualea dichotoma</i>	Vochysiaceae
<i>Qualea grandiflora</i>	Vochysiaceae
<i>Qualea parviflora</i>	Vochysiaceae

<i>Qualea parviflora</i>	Vochysiaceae
<i>Rapanea guianensis</i>	Myrsinaceae
<i>Salvertia convallariodora</i>	Vochysiaceae
<i>Sterculia striata</i>	Sterculiaceae
<i>Syagrus oleracea</i>	Arecaceae
<i>Symplocos uniflora</i>	Symplocaceae
<i>Terminalia argenta</i>	Combretaceae
<i>Vochysia</i> sp.	Vochysiaceae
<i>Zeyheria</i> sp.	Bignoniaceae

Identified species of ornamental leaves

Scientific name	Botanic family
-	Poaceae
-	Fabaceae
-	Melastomataceae
<i>Adiantum subcordatum</i>	-
<i>Andropogon leucostachyus</i>	-
<i>Aristida pallens</i>	Poaceae
<i>Aristida riparia</i>	Poaceae
<i>Aspidosperma subincanum</i>	Apocynaceae
<i>Aulonemia effuse</i>	Poaceae
<i>Axonopus aureus</i>	Poaceae
<i>Axonopus brasileinsis</i>	Poaceae
<i>Byrsonima crassifolia</i>	Malpighiaceae
<i>Chamaecrista orbiculata</i>	Fabaceae
<i>Cymbopogon densiflorus</i>	Poaceae
<i>Diospyros sericea</i>	Ebenaceae
<i>Geonoma schottiana</i>	Arecaceae

<i>Gynerium sagittatum</i>	Poaceae
<i>Hymenaea stigonocarpa</i>	Fabaceae
<i>Loudetiopsis chrysothrix</i>	-
<i>Mauritia flexuosa</i>	Arecaceae
<i>Palicourea rigida</i>	Rubiaceae
<i>Roupala brasiliensis</i>	Proteaceae
<i>Schefflera macrocapa</i>	Araliaceae
<i>Schizachyrium condensatum</i>	-
<i>Sorghastrum minarum</i> <i>Sorghum arundinaceum</i>	Poaceae
<i>Strychnos pseudoquina</i>	Loganiaceae
<i>Vatairea macrocarpa</i>	Fabaceae

Identified other ornamental species

Scientif name	Botanic family
<i>Acrocomia aculeata</i>	Arecaceae
<i>Allagoptera leucocalyx</i>	Arecaceae
<i>Attalea Speciosa</i>	Arecaceae
<i>Attalea Speciosa</i>	Arecaceae
<i>Bambusa sp.</i>	Poaceae
<i>Bambusa vulgaris</i>	Poaceae
<i>Heteropsis jenmani</i>	Araceae
<i>Mauritia flexuosa</i>	Arecaceae
<i>Mauritia flexuosa</i>	Arecaceae
<i>Mauritia flexuosa</i>	Arecaceae
<i>Syagrus flexuosa</i>	Arecaceae
<i>Syagrus petrea</i>	Arecaceae

ANEXO 03 – PHOTOS

1. Cultivated food plants



Photo 1. Rice local seeds (author: Maria Flor Brazil)



Photo 2. Black bena local seeds (author: Valda Nogueira)



Photo 3. Variety of local maize (author: Valda Nogueira)



Photo 4. Seriguela fruit - *Spondias purpurea* (author: Valda Nogueira)

2. Native food plants



Photo 5. Fern bud (author: Valda Nogueira)



Photo 6. *Pequi* fruit collection (author: Valda Nogueira)



Photo 7. Gondó (author: Valda Nogueira)



Photo 8. “Lapa” okra (author: Gabriel Dayer)

3. Crop fields



Photo 9. Maize and bean field in Mata dos Crioulos (author: Valda Nogueira)



Photo 10. Crop field with protection cross in the Lavra community (author: Gabriel Dayer)



Photo 11. Rice field in Vargem do Inhaí (author: Valda Nogueira)



Photo 12. Corn and beans field in the Raíz community (author: Valda Nogueira)

4. Homegardens



Photo 13. Vegetable beds (author: Gabriel Dayer)



Photo 14. Resident watering the plants (author: Valda Nogueira)



Photo 15. Resident feeding chickens (author: Valda Nogueira)



Photo 16. Local breed - "caipira" pig (author: Valda Nogueira)

5. Sempre-vivas flowers



Photo 17. Sempre-vivas harvest (author: João Roberto Ripper)



Photo 18. Return from the flower field (author: João Roberto Ripper)



Photo 19. Women gathering flowers (author: Valda Nogueira)



Photo 20. Arranging flowers to dry (author: Tiago Carvalho)

6. Rustic Cattle



Photo 21. Cattle in native fields pasture (author: Gabriel Dayer)



Photo 21. Cattle close to home in the rainy season (author: Valda Nogueira)



Photo 23. *Lapa* home in the *native fields* (author: Gabriel Dayer)



Photo 24. *Lapa* production center for cassava flour (author: João Ripper)

7. Food culture



Photo 25. Pot on a wood-burning stove (author: Elisa Cotta)



Photo 26. Cooked cassava (author: Elisa Cotta)



Photo 27. Preparation of *requeijão* cheese (author: Valda Nogueira)



Photo 28. Preparation of kale (author: João Roberto Ripper)

8. Artifacts



Photo 29. Baskets made of “golden grass” (author: Valda Nogueira)



Photo 30. Stone to produce flour (author: Valda Nogueira)



Photo 31. Sugar mill (author: Valda Nogueira)



Photo 32. Broom made of native flora (author: Valda Nogueira)

9. Water



Photo 33. Water surface (author: Elisa Cotta)



Photo 34. Waterfall (author: Valda Nogueira)



Photo 35. Jequitai River (author: Gabriel Dayer)



Photo 36. Creek in em Vargem do Inhaí (author: João Roberto)

10. Comunidade



Photo 37. House in the community (author: Valda Nogueira)



Photo 38. Chapel (author: Valda Nogueira)



Photo 39. Three-Kings Day festival (author: João Roberto Ripper)



Photo 40. Musical Instrument – drum (author: Valda Nogueira)

ANNEX 04 - AUDIOVISUAL DOCUMENTARY LINK

Documenty link: <https://vimeo.com/276196045>

Password: brasil

ANNEX 05 - OFFICIAL GOVERNMENT STATEMENTS OF SUPPORT FOR THE PROPOSAL TO BECOME A GIAHS SITE.



GOVERNO DO ESTADO DE MINAS GERAIS
Palácio Tiradentes



OF.GAB.GOV. nº 210/18

Belo Horizonte, 24 de maio de 2018.

Prezada Maria de Fátima Alves,

Recebi, com grande orgulho e satisfação, a notícia da seleção do sistema agrícola tradicional dos(as) apanhadores(as) de flores sempre-vivas de Minas Gerais para o programa de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial, da Organização das Nações Unidas para Alimentação e Agricultura (FAO/ONU).

As mineiras e os mineiros apanhadores de sempre-vivas são um povo tradicional que, habitando a Serra do Espinhaço, transformaram a cultura do extrativismo em uma atividade que encanta gente de todos os lugares com a beleza peculiar e longevidade dessas flores. Um povo que, por meio dessa atividade, preserva uma cultura de tempos imemoriais e a rica diversidade de uma região muito especial de nosso estado.

Reconhecemos e apoiamos esse povo e sua cultura, do que é exemplo a concessão, em 2015, da Medalha JK, uma das mais importantes honorarias do Estado de Minas Gerais, à senhora Jovita Maria Gomes Correa, uma das expressivas lideranças das Comunidades. Com diálogo e participação social, o Governo de Minas Gerais continuará empenhado em regulamentar e fomentar a atividade do apanho das flores sempre-vivas, assegurando a adoção de boas práticas de manejo.

Diante da alta relevância sociocultural e ambiental desse sistema agrícola tradicional, o Governo de Minas Gerais se soma às Prefeituras de Diamantina, Presidente Kubitschek e Buenópolis no apoio à candidatura dos(as) apanhadores(as) de flores sempre-vivas ao processo seletivo da FAO/ONU. Estamos, desde já, mobilizados para que o apanho daquelas flores conquiste o reconhecimento como Sistema Importante do Patrimônio Agrícola Mundial, para mostrar ao mundo mais uma das riquezas de nossa Minas Gerais que tanto nos orgulha.

Atenciosamente,


Fernando Damata Pimentel
Governador do Estado de Minas Gerais

À Senhora
Maria de Fátima Alves
Integrante da Comissão em Defesa dos Direitos das Comunidades Extrativistas
(COCEDEX)
Diamantina – MG

LR/14



PREFEITURA MUNICIPAL DE DIAMANTINA

SECRETARIA MUNICIPAL DE MEIO AMBIENTE

Diamantina, 09 de fevereiro de 2018

À Sua Excelência o Senhor
Fernando Pimentel
Governador do Estado de Minas Gerais

Assunto: Candidatura ao programa da FAO-ONU de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial (SIPAM)

Senhor Governador,

A Prefeitura Municipal de Diamantina - MG vem, por meio desta, declarar seu apoio à candidatura do Sistema Agrícola Tradicional das Comunidades de Apanhadores de Flores Sempre-vivas ao programa mundial de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial (SIPAM/GIAHS) da Organização das Nações Unidas para a Alimentação e a Agricultura (FAO - ONU).

Neste processo de candidatura, que é a primeiro no país, a Prefeitura Municipal de Diamantina integra o Grupo de Trabalho responsável pela elaboração das peças que subsidiarão o dossiê de candidatura ao programa SIPAM/FAO.

Importante ressaltar que os territórios tradicionais das comunidades apanhadoras de flores sempre-vivas representam um patrimônio material e imaterial genuinamente mineiro e este reconhecimento pela FAO-ONU abrirá um campo de oportunidades e certamente engrandecerá a imagem de nossos municípios e a cultura do estado de Minas Gerais na arena internacional.

Atenciosamente,


Juscelino Brasiliano Roque
Prefeito Municipal

JUSCELINO BRASILIANO ROQUE
PREFEITO MUNICIPAL



PREFEITURA MUNICIPAL DE PRESIDENTE KUBITSCHEK

RUA AGOSTINHO DE OLIVEIRA MALAQUIAS, 35 - CEP 39135-000 - CENTRO - TEL.: (38) 3545-1122 / 1134

Emails: convenios@pk.mg.gov.br - compras@pk.mg.gov.br - licitacoes@pk.mg.gov.br - almoxtafado@pk.mg.gov.br
contabilidade@pk.mg.gov.br - financa@pk.mg.gov.br - cultura@pk.mg.gov.br - agricultura@pk.mg.gov.br - educacao@pk.mg.gov.br
saude@pk.mg.gov.br - gabinete@pk.mg.gov.br - social@pk.mg.gov.br - administracao@pk.mg.gov.br

Ofício: 020/2018

Serviço: Gabinete do Prefeito

Presidente Kubitschek, 08 de fevereiro de 2018

À Sua Excelência o Senhor

Fernando Pimentel

Governador do Estado de Minas Gerais

Assunto: Candidatura ao programa da FAO-ONU de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial (SIPAM)

Senhor Governador,

A Prefeitura Municipal de Presidente Kubitschek - MG vem, por meio desta, declarar seu apoio à candidatura do Sistema Agrícola Tradicional das Comunidades de Apanhadores de Flores Sempre-vivas ao programa mundial de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial (SIPAM/GIAHS) da Organização das Nações Unidas para a Alimentação e a Agricultura (FAO - ONU).

Neste processo de candidatura, que é a primeira no país, a Prefeitura Municipal de Presidente Kubitschek integra o Grupo de Trabalho responsável pela elaboração das peças que subsidiarão o dossiê de candidatura ao programa SIPAM/FAO.

Importante ressaltar que os territórios tradicionais das comunidades apanhadoras de flores sempre-vivas representam um patrimônio material e imaterial genuinamente mineiro e este reconhecimento pela FAO-ONU abrirá um campo de oportunidades e certamente engrandecerá a imagem de nossos municípios e a cultura do estado de Minas Gerais na arena internacional.

Atenciosamente,


Prefeito Municipal
Presidente Kubitschek/MG



PREFEITURA MUNICIPAL DE BUENÓPOLIS

C.F.P.: 39.230-000 - Estado de Minas Gerais

Ofício 108/GABPREF/2018

Ref.: Solicitação (Faz)

Buenópolis/MG, 08 de fevereiro de 2018

Assunto: Candidatura ao programa da FAO-ONU de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial (SIPAM)

Senhor Governador,

A Prefeitura Municipal de Buenópolis - MG vem, por meio desta, declarar seu apoio à candidatura do Sistema Agrícola Tradicional das Comunidades de Apanhadores de Flores Sempre-vivas ao programa mundial de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial (SIPAM/GIAHS) da Organização das Nações Unidas para a Alimentação e a Agricultura (FAO - ONU).

Neste processo de candidatura, que é a primeiro no país, a Prefeitura Municipal de Buenópolis integra o Grupo de Trabalho responsável pela elaboração das peças que subsidiarão o dossiê de candidatura ao programa SIPAM/FAO.

Importante ressaltar que os territórios tradicionais das comunidades apanhadoras de flores sempre-vivas representam um patrimônio material e imaterial genuinamente mineiro e este reconhecimento pela FAO-ONU abrirá um campo de oportunidades e certamente engrandecerá a imagem de nossos municípios e a cultura do estado de Minas Gerais na arena internacional.

Respeitosamente,


CÉLIO SANTANA
Prefeito Municipal

À Sua Excelência o Senhor
Fernando Pimentel
Governador do Estado de Minas Gerais
Belo Horizonte/MG



MOÇÃO DE APOIO

O Conselho de Segurança Alimentar e Nutricional Sustentável de Minas Gerais – **Consea-MG**, aprovou **ad referendum** a presente moção de apoio à candidatura do sistema agrícola tradicional dos/as apanhadores(as) de flores sempre-vivas ao programa de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial - SIPAM (ou GIAHS, na sigla em inglês) da Organização das Nações Unidas para a Alimentação e a Agricultura (FAO-ONU).

As presente moção se fundamenta na Lei Estadual nº 18.374 que instituiu a Política Estadual de Incentivo à Formação de Bancos Comunitários de Sementes de Cultivares Locais, Tradicionais ou Crioulos; na Lei Estadual nº 21.146/2014 que instituiu a Política Estadual de Agroecologia e Produção Orgânica (PEAPO); na Lei Estadual nº 21.147/2014 que instituiu a Política Estadual para o Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais de Minas Gerais; na Lei Estadual nº 21.156/2014 que instituiu a Política Estadual de Desenvolvimento Rural Sustentável da Agricultura Familiar (PEDRAF) e na Lei Estadual 22.806/2017 que institui a Política Estadual de Segurança Alimentar e Nutricional Sustentável (Pesans).

As comunidades tradicionais que se autodeterminam como apanhadores(as) de flores sempre-vivas, que vivem na Serra do Espinhaço e estão localizadas nos municípios de Diamantina, Buenópolis e Presidente Kubistchek, representados pela Comissão em Defesa dos Direitos das Comunidades Extrativistas (CODECEX), possuem um modo de ser, fazer e viver peculiar, com práticas agrícolas tradicionais de relevância sociocultural e agroecológica.

Os(as) apanhadores(as) de flores sempre-vivas realizam serviços ecossistêmicos de valor imensurável na proteção da biodiversidade e na segurança alimentar de suas comunidades. Eles(elas) são agricultores familiares e jardineiros da Serra do Espinhaço, guardiões de sementes de flores e de sementes crioulas. Suas práticas agrícolas, como o uso de “roças de toco”, com rotatividade de área de plantio, num continuado gesto de harmonia e de observância à resiliência da terra, são práticas agroecológicas.



GOVERNO DO ESTADO DE MINAS GERAIS
Conselho de Segurança Alimentar e Nutricional Sustentável de Minas Gerais
CONSEA-MG

A comunidade tradicional dos(as) apanhadores(as) de flores sempre vivas e seus territórios constituem um patrimônio material e imaterial que deve ser reconhecido pelo Estado.

É um sistema agrícola criado a partir de práticas transmitidas por gerações de agricultores, em especial remanescentes de quilombolas. Num processo de resistência, superam condições de desvantagem geográficas, com solos rochosos e de altitudes, e conseguem garantir uma produção sustentável e sem uso de agrotóxico. E ainda, cabe ressaltar que as práticas destas comunidades tradicionais se adequam aos objetivos do desenvolvimento sustentável – ODS, recomendados pela ONU.

O Consea-MG reconhece no Sistema Agrícola Tradicional dos Apanhadores de Sempre Vivas as características essenciais dos Sistemas Importantes do Patrimônio Agrícola Mundial – SIPAM, conforme definido pela FAO, são *“sistemas de uso da terra e paisagens notáveis, ricos em biodiversidade de importância global, desenvolvidos a partir da coadaptação de uma comunidade com o seu ambiente de acordo com suas necessidades e aspirações para alcançar o desenvolvimento sustentável”*.

Pelos motivos expostos, o Consea-MG reconhece o sistema agrícola tradicional praticado pelos(as) apanhadores(as) de flores sempre vivas, por sua função sociocultural e agroecológica. E reafirma seu apoio institucional para as atividades necessárias à conservação destes territórios, dotados de valores singulares, próprios de cada Povo e Comunidade Tradicional.

Emitimos a presente Moção para que os órgãos públicos e a FAO/ONU tenham ciência de nossa manifestação pública de reconhecimento e apoio ao sistema agrícola tradicional dos(as) apanhadores(as) de flores sempre-vivas.

Belo Horizonte, 18 de junho de 2018.



Presidente do CONSEA-MG

Cidade Administrativa Presidente Tancredo Neves
Rodovia Papa João Paulo II, 4001 - Edifício Gerais 14º andar - CEP 31630-901- Belo Horizonte - MG
Tel: (31) 3915-0927
consea@consea.mg.gov.br - www.consea.mg.gov.br



GOVERNO DO ESTADO DE MINAS GERAIS
SECRETARIA DE ESTADO DE DESENVOLVIMENTO AGRÁRIO

MOÇÃO CEDRAF Nº 1, DE 19 DE ABRIL DE 2018.

Reconhecimento
e apoio ao
sistema
agrícola
tradicional
dos/as
apanhadores/as
de flores
sempre-vivas

O Conselho Estadual de Desenvolvimento Rural Sustentável – CEDRAF-MG, em sua 36ª Reunião Ordinária, realizada em 19 de abril de 2018, aprovou a presente moção de apoio à candidatura do sistema agrícola tradicional dos (as) apanhadores (as) de flores sempre-vivas ao programa de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial - SIPAM (ou GIAHS, na sigla em inglês) da Organização das Nações Unidas para a Alimentação e a Agricultura (FAO-ONU).

As presente moção se fundamenta na Lei Estadual nº 18.374 que instituiu a Política Estadual de Incentivo à Formação de Bancos Comunitários de Sementes de Cultivares Locais, Tradicionais ou Crioulos; na Lei Estadual nº 21.146/2014 que instituiu a Política Estadual de Agroecologia e Produção Orgânica (PEAPO); na Lei Estadual nº 21.147/2014 que instituiu a Política Estadual para o Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais de Minas Gerais; e na Lei Estadual nº 21.156/2014 que instituiu a Política Estadual de Desenvolvimento Rural Sustentável da Agricultura Familiar (PEDRAF).

As comunidades tradicionais que se autodeterminam como apanhadores/as de flores sempre-vivas, que vivem na Serra do Espinhaço e estão localizadas nos municípios de Diamantina, Buenópolis e Presidente Kubistchek, representados pela Comissão em Defesa dos Direitos das Comunidades Extrativistas (CODECEX), possuem um modo de ser, fazer e viver peculiar, com práticas agrícolas tradicionais de relevância sociocultural e agroecológica.

Os(as) apanhadores(as) de flores sempre-vivas realizam serviços ecossistêmicos de valor imensurável na proteção da biodiversidade e na segurança alimentar de suas comunidades. Eles(elas) são agricultores familiares e jardineiros da Serra do Espinhaço, guardiões de sementes de flores e de sementes crioulas. Suas práticas agrícolas, como o uso de "roças de toco", com rotatividade de área de plantio, num continuado gesto de harmonia e de observância a resiliência da terra é agroecológica.

A comunidade tradicional de(as) apanhadores(as) de flores sempre vivas e seus territórios constituem um patrimônio material e imaterial que deve ser reconhecido pelo Estado. É um sistema agrícola criado a partir de práticas transmitidas por gerações de agricultores, em especial remanescentes de quilombolas. Num processo de resistência superaram condições de desvantagem geográficas, com solos rochosos e de altitudes, e conseguem garantir uma produção sustentável e sem uso de agrotóxico. E ainda, cabe ressaltar que as práticas destas comunidades tradicionais se adequam aos objetivos do desenvolvimento sustentável – ODS, recomendados pela ONU.

O CEDRAF reconhece no Sistema Agrícola Tradicional dos Apanhadores de Sempre Vivas as características essenciais dos Sistemas Importantes do Patrimônio Agrícola Mundial – SIPAM, conforme definido pela FAO, são "sistemas de uso da terra e paisagens notáveis, ricos em biodiversidade de importância global, desenvolvidos a partir da coadaptação de uma comunidade com o seu ambiente de acordo com suas necessidades e aspirações para alcançar o desenvolvimento sustentável".

Pelos motivos expostos, o CEDRAF reconhece o sistema agrícola tradicional praticado pelos(as) apanhadores de flores sempre vivas, por sua função sociocultural e agroecológica. E reafirma seu apoio institucional para as atividades

necessárias à conservação destes territórios, dotados de valores singulares, próprios de cada Povo e Comunidade Tradicional.

Emitimos a presente Moção, para que os órgãos públicos e a FAO/ONU, tenha ciência de nossa manifestação pública de reconhecimento e apoio ao sistema agrícola tradicional dos/as apanhadores/as de flores sempre-vivas.

Belo Horizonte, 19 de abril de 2018.



Documento assinado eletronicamente por Alexandre de Lima Chumbinho, Secretário(a) de Estado Adjunto, em 19/06/2018, às 17:47, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 47.227, de 26 de julho de 2017](#).



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GOVERNO DO ESTADO DE MINAS GERAIS
SECRETARIA DE ESTADO DE DESENVOLVIMENTO AGRÁRIO

CONSELHO DIRETOR PRÓ-PEQUI

MOÇÃO Nº 01, DE 24 DE MAIO 2018

O Conselho Diretor Pró-Pequi, em sua 30ª Reunião Ordinária, realizada em 24 de maio de 2018, aprovou a presente moção de apoio à candidatura do sistema agrícola tradicional dos/as apanhadores(as) de flores sempre-vivas ao programa de reconhecimento de Sistemas Importantes do Patrimônio Agrícola Mundial - SIPAM (ou GIAHS, na sigla em inglês) da Organização das Nações Unidas para a Alimentação e a Agricultura (FAO-ONU).

As presente moção se fundamenta na Lei Estadual 13.965/2001, que Cria o Programa Mineiro de Incentivo ao Cultivo, à Extração, ao Consumo, à Comercialização e à Transformação do Pequi e Demais Frutos e Produtos Nativos do Cerrado – Pró-Pequi; Lei Estadual nº 18.374/2009, que instituiu a Política Estadual de Incentivo à Formação de Bancos Comunitários de Sementes de Cultivares Locais, Tradicionais ou Crioulos; na Lei Estadual nº 21.146/2014 que instituiu a Política Estadual de Agroecologia e Produção Orgânica (PEAPO); na Lei Estadual nº 21.147/2014 que instituiu a Política Estadual para o Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais de Minas Gerais; e na Lei Estadual nº 21.156/2014 que instituiu a Política Estadual de Desenvolvimento Rural Sustentável da Agricultura Familiar (PEDRAF).

As comunidades tradicionais que se autodeterminam como apanhadores(as) de flores sempre-vivas, que vivem na Serra do Espinhaço e estão localizadas nos municípios de Diamantina, Buenópolis e Presidente Kubistchek, representados pela Comissão em Defesa dos Direitos das Comunidades Extrativistas (CODECEX), possuem um modo de ser, fazer e viver peculiar, com práticas agrícolas tradicionais de relevância sociocultural e agroecológica.

Os(as) apanhadores(as) de flores sempre-vivas realizam serviços ecossistêmicos de valor imensurável na proteção da biodiversidade e na segurança alimentar de suas comunidades. Eles(elas) são agricultores familiares e jardineiros da Serra do Espinhaço, guardiões de sementes de flores e de sementes crioulas. Suas práticas agrícolas, como o uso de "roças de toco", com rotatividade de área de plantio, num continuado gesto de harmonia e de observância a resiliência da terra é agroecológica.

A comunidade tradicional de(as) apanhadores(as) de flores sempre vivas e seus territórios constituem um patrimônio material e imaterial que deve ser reconhecido pelo Estado.

É um sistema agrícola criado a partir de práticas transmitidas por gerações de agricultores, em especial remanescentes de quilombolas. Num processo de resistência superam condições de desvantagem geográficas, com solos rochosos e de altitudes, e conseguem garantir uma produção sustentável e sem uso de agrotóxico. E ainda, cabe ressaltar que as práticas destas comunidades tradicionais se adequam aos objetivos do desenvolvimento sustentável – ODS, recomendados pela ONU.

O CONSELHO DIRETOR PRÓ-PEQUI reconhece no Sistema Agrícola Tradicional dos Apanhadores de Sempre Vivas as características essenciais dos Sistemas Importantes do Patrimônio Agrícola Mundial – SIPAM, conforme definido pela FAO, são "sistemas de uso da terra e paisagens

notáveis, ricos em biodiversidade de importância global, desenvolvidos a partir da coadaptação de uma comunidade com o seu ambiente de acordo com suas necessidades e aspirações para alcançar o desenvolvimento sustentável”.

Pelos motivos expostos, o CONSELHO DIRETOR PRÓ-PEQUI reconhece o sistema agrícola tradicional praticado pelos(as) apanhadores de flores sempre vivas, por sua função sociocultural e agroecológica. E reafirma seu apoio institucional para as atividades necessárias à conservação destes territórios, dotados de valores singulares, próprios de cada Povo e Comunidade Tradicional.

Emitimos a presente Moção, para que os órgãos públicos e a FAO/ONU, tenha ciência de nossa manifestação pública de reconhecimento e apoio ao sistema agrícola tradicional dos/as apanhadores(as) de flores sempre-vivas.

Belo Horizonte, 24 de maio 2018.

LÁZARO AUGUSTO DOS REIS
PRESIDENTE DO CONSELHO DIRETOR PRÓ-PEQUI



Documento assinado eletronicamente por **Lazaro Augusto dos Reis, Subsecretário(a)**, em 19/06/2018, às 17:44, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 47.222, de 26 de julho de 2017](#).



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