

# The ethnoecological investigation of biocultural diversity in Northern Minas Gerais –Brazil– and its contribution to environmental justice

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## Abstract

This article was elaborated from a bibliographical review of studies in anthropology, ethnoecology and environmental sociology carried out in the North of Minas Gerais – Brazil - and also from fieldwork experiences among the traditional fishery communities of the Middle São Francisco River. Its objective was to discuss the importance of research for the resolution of environmental conflicts generated by the implementation of Integral Protection Conservation Units in traditional territories. In addressing the set of environmental knowledge produced by traditional populations in their interactions with nature, ethnosciences allow a better understanding of human-environmental history in certain spaces and biomes, the formation of identities and territorialities. Understanding these processes and elements is fundamental to guarantee of human and territorial rights, combined with a model of community management that allows access to nature, its sustainable use and protection.

**Keywords:** Identities. Ethnoecology. Environmental Conflicts. Co-Management. Development.

## Introduction

Several studies on the traditional populations of the Brazilian semi-arid region show the relationship between man and nature and its importance for the conservation of Natural Resources in different *sertaneja* [Brazilian backlands semi-arid] landscapes. These populations have extensive experience and familiarity with the environment and are

therefore subject of interdisciplinary research aimed at a better understanding of regional biodiversity and sustainable management of the various resources there present. However, the hegemonic economic development project implemented in Brazil, especially after 1960, caused the total transformation of these landscapes. Based on forestry, large-scale

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irrigation monoculture, mining, steel industry, and water business among other examples of projects, this development model has caused enormous environmental impacts and conflicts, especially for water resources and land; resources on which traditional rural populations depend (ZHOURI; LASCHEFSKI, 2010).

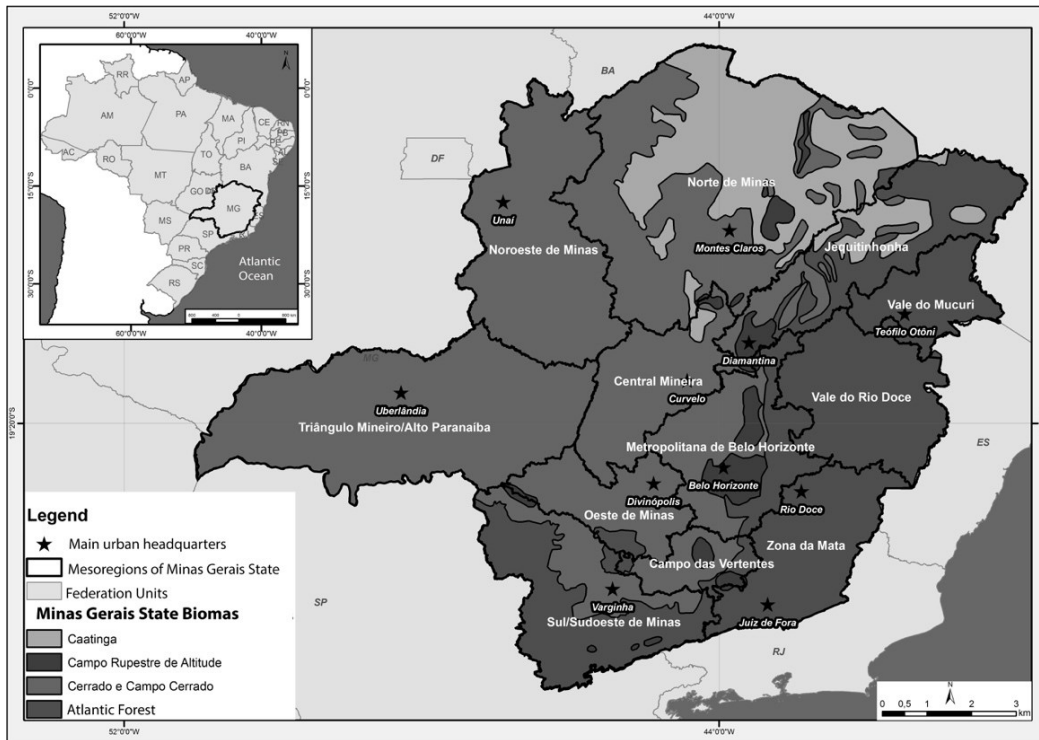
Adhering to this development policy concept, based on the growth of the economy by exporting commodities and on the growth of the mining industry, is ongoing, as the main environmental policy mitigating the impacts generated, the creation of Integral Protection Conservation Units (MMA, 2000). Different types of Conservation Units (such as National and State Parks, Ecological Stations, Nature Reserves, among others) were created in the territories of traditional peoples and communities in Northern Minas Gerais. This article analyzes the contribution of studies about traditional populations both for the conservation of biological resources and for ensuring the maintenance of traditional territories. Thus, it is expected to create a dialogue between different disciplines for the development of a new concept

of environmental and territorial management in Brazil; one that is more democratic and participative, having social equity based on socio-environmental sustainability (ANAYA; ESPIRITO-SANTO, 2018; THÉ et al., 2008).

## Peoples, traditional communities and their territories in the north of Minas Gerais

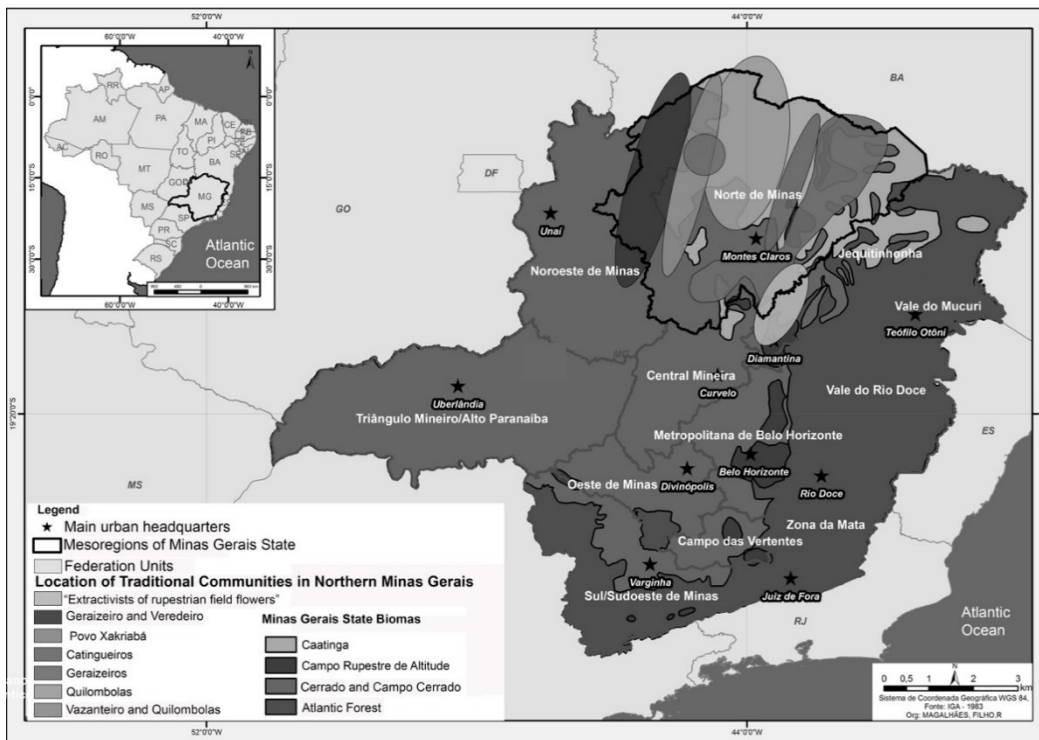
The north of Minas Gerais has a great diversity of vegetation and landscapes (Figure 1) which are inhabited by several known populations recognized as traditional (Figure 2). Among them are the *geraizeiros* [traditional population from northern Minas Gerais Brazilian savannah], *veredeiros* [farmers from the Brazilian palm swamps], riverside populations, marshlanders, *caatingueiros* [*Caatinga* population], *quilombolas* [maroons] and Indigenous, among others. Some recognize themselves only as *sertanejos* [from the Brazilian backlands] or even belonging to more than one group, being *quilombola* [maroon] and also marshlander, for example (BRANDÃO, 2012; COSTA, 2006; DAYRELL, 1998).

Figure 1 - Minas Gerais state Biomes



Org.: Thé and Magalhães-Filho (2018).

Figure 2 - Location of Traditional Communities in Northern Minas Gerais



Source: adapted from Dayrell (2016).

Thus, the northern Minas Gerais backlands are not composed of a single “bioregional” identity (SATO, 2005) but rather of several identities that blend and complement each other forming a unique and complex landscape. Landscapes are a type of spatial organization resulting from the interaction between natural processes and human activities (BERQUE, 2012; DIEGUES, 2000). According to Costa (2006) this socio-environmental complexity which is made up of diverse identities and landscapes is due to the region's geography - inserted in an area of transition between the Brazilian savanna, the Caatinga and the Atlantic Forest. These collective identities were built through the complex socio-historical processes of these communities. Part of these historical processes can be glimpsed from the description of these human groups' experiences with the environment and biodiversity over time up to the present day.

According to Diegues and Arruda (2001) traditional populations are culturally distinct groups that have built a particular way of dealing with nature and its resources during their historical journey. They also consider being important the social cooperation between group members, adaptation to a specific ecological environment and a varying degree of isolation. Dayrell (1998) refers to the traditional society as being peasant, composed of farmers, extractive collectors, artisanal prospectors, and fishermen. Such a society, according to Toledo (1991), consumes part or all of what it acquires with its

work and with its intellectual environment, with its beliefs and socially shared knowledge. However, according to this author, traditional does not mean old, static but rather a dynamic cultural system, which transforms and renews itself.

Territoriality is another strong characteristic of traditional populations. According to Little (2004), territoriality is the collective effort that a social group historically builds by occupying, using, controlling and developing a sense of belonging to a portion of its biophysical environment, which becomes a territory of common use. For Saquet (2007), territory means identity understood as the product of reciprocal interactions, of territorialities within the framework of the relationships that take place between society and nature (SAQUET, 2007). Malmberg (2019) suggests the concept of territoriality as a phenomenon expressed by determining limits and defending a somewhat unique space to which a person or group of human beings are emotionally bound to; the space in which boundaries are set by material and non-material structures and by behaviors that show the group's adherence to this area.

Based on a review about the concepts of peoples, communities, and traditional communities, and on research experiences from Project “*Opará: traditions, identities and territorialities and the changes among rural and riverside populations of the Backlands described by Guimarães Rosa*”, Brandão updated the

concept of traditional community by including the community's experience about environmental conflicts and the relationship regarding market economic logic:

[...] a local social group that develops: [...] e) updating of the memory of the historicity of past and present struggles and resistance in order to stay in the ancestral territory; f) life experience in surrounded and/or threatened territory; g) current strategies for access to rights, to less peripheral goods markets and to environmental conservation. (2012, p. 379).

The north of Minas Gerais is home to several traditional peoples and communities, groups that have historically built strategies to maintain their territories against the invasion of "*des-envolvimento*" [w/o the dash meaning development but as is dis-involvement] projects. The term *des-envolvimento*, as proposed by Viana (1999, p.242-243), refers to the historical process of loss of involvement by traditional communities regarding their space, history, dignity, knowledge, and expertise. This causes damage to environmental preservation and citizenship. This dynamic goes back to the Empire and is present up to the modern State, witnessed by the struggles against farms, agribusiness, forestry, mining, and, more recently, Conservation Units.

In order to better understand these populations and their relation to the environment, we must also understand the northern region of Minas Gerais. According to Dayrell (1998) hilltops, plateaus and slopes, also called *Gerais*, are dominated by the Brazilian

savanna and occupy 63.4% of the landscape. The *caatinga* occupies 12.9% and the dry forest 7.2%. Riparian forests, palm swamps, and *pindaiba* (*Duguetia lanceolata*) plantations occupy 3% of the territory and the corresponding 14% or so that are left are mostly composed of transitional vegetation from Brazilian savanna, forests, and *caatingas*.

It also has a hydrographic network of 1180 rivers and streams flowing from three basins: from the São Francisco, the Jequitinhonha, and the Pardo rivers. The Brazilian savanna is the main biome where traditional peoples and communities establish themselves in the region. The Brazilian savanna, according to Barbosa and Nascimento (1990), has been occupied by human populations for at least 11,000 years. Considered the second largest Brazilian biome, it corresponds to 21% of the national territory and is surpassed only by the Amazon. Different ecosystems that are typical of central Brazil are present in the Brazilian savanna, such as savannas, forests, grasslands, and riparian forests (RIBEIRO; SANO; SILVA, 1981). Next to the riparian forests, there are also a variety of wet fields, palm swamps, marshes, and pindaiba fields. In the north of Minas Gerais, specifically, the Brazilian savanna still suffers strong influence from the Caatinga biome, increasing the heterogeneity of ecological resources in this region. In fact, for Dayrell (1998), the transitional forms of vegetation influenced the diversification of the environments and led to the development of access strategies and the use of the different

habitats, favoring the complex and rich socio biodiversity found in northern Minas Gerais.

Thus, in general, we can divide the traditional populations of this region, still in present days, according to the landscape in which they live and the resources they use from this landscape (ARAÚJO, 2008; ANAYA; ESPÍRITO-SANTO, 2018; ANAYA et al., 2012; COSTA, 2011; DAYRELL et al., 2019; NOGUEIRA, 2009; RODRIGUES; THÉ, 2014). The *geraizeiros* live in the *gerais* [general]; *veredeiros*, in the *veredas* [palm swamps]; *riversiders* and *marshlanders* live on the banks of the São Francisco River; *caatingueiros* live in the *Caatingas*; *quilombolas* [maroons] are the remnants of *quilombos* [Brazilian hinterland settlements] and the indigenous belong to the *Xakriabá* ethnic group. These self-designated identities are elaborated by the groups from contrast or differences with the other groups with whom they establish social relations, as stated by Barth (2005).

Dayrell (1998) states that the *gerais* [general] refers to the plateaus, slopes, and valleys of regions dominated by the Brazilian savanna often with acidic and low fertility soils. "Geraizeiros, as culturally and distinctly are called the inhabitants of the *gerais*, have developed the ability to cultivate on the banks of small watercourses a diversity of crops such as manioc, sugarcane, peanuts, many types of beans, corn, and rice" (DAYRELL, 1998, p.56). The cattle and pig production systems was a "free-range" type and, until the 1970s, the communal use of plateaus, plains, and woodlands

was hegemonic. It is also in these areas, which are called, generically, general, that these communities' traditional livelihood, through activities such as hunting, gathering of various types of fruit, picking and cultivation of medicinal plants, and the extraction of wood for various purposes and of wild honey. "The products they bring to the market – manioc flour, starch, rapadura [*Panela*], brandy, native fruit, medicinal plants, handicrafts - reflect the environment, the way of life, the possibilities and potential of the agro-ecosystems where they live." (DAYRELL, 1998, p. 57).

*Veredas* [palm swamps] are savannic formations characterized by permanent wetlands, colonized by populations of palm trees of the *Mauritia flexuosa* species and some shrubby species (RIBEIRO; WALTER, 1998). The palm swamp peoples, or *veredeiros*, according to Costa (2011) are identified by the contrast between these groups and others that live in the same geographical area: the woodlanders and plateauers. The *veredeiros* [palm swamper] of the high-mid São Francisco raise cattle, farm, extract from nature, and hunt and fish (COSTA, 2011).

According to Jacinto (1998) the economic base of the palm swamp peoples lies mainly in the farming of beans, manioc, corn, and rice, which is cultivated through the "sewage" technique - narrow channels dug from the palm swamps for crop irrigation. Also, according to Rodrigues and Thé (2014), these peoples have a specific relationship with water resources,

understood as a common good that cannot be owned privately.

Luz de Oliveria (2005), in their research on issues of identity and the dynamics of the marshlanders in northern Minas Gerais, refers to this group as inhabitants of the flood areas in the São Francisco river basin, including the Islands. They are characterized by the practice of “low tide” agriculture (cultivation carried out in the sediments deposited on the flat banks of the São Francisco river, also known as “the marshes”), of dry farming (farming in “highlands” or “cliffs” at the riverbanks), of livestock, and of fruit and wood extractivism.

Maroons or remnants of Brazilian hinterland settlements make up one of the most important traditional peoples in northern Minas Gerais. This group originates at the banks of creeks, lagoons, and rivers that make up the Verde Grande river basin, having relations with settlements along the São Francisco river (COSTA, 2006). Many of the production and extractivism traditions of the other traditional communities settled along the São Francisco river mentioned above have their origins in the Afro-Brazilian and indigenous culture.

The only remaining indigenous population in northern Minas Gerais belongs to the ethnic group *Xakriabá*, the original population of the *Tapuias*, which correspond to the groups that are part of the group's language (*Macro-Jê*, said to be the main inhabitants of the Cerrado biome in the pre-colonial period) (RIBEIRO, 2005). The *Xakriabá* people, currently represented 6,442

individuals, are settled between São João das Missões and Itacarambi, in a transitional region of cerrado and caatinga (GOMES, 1998). The *Xakriabá* production system was established similarly the regional production (cattle breeding, crops, extractivism and fishery). However, with the decrease of access to the original indigenous territory, there was a shift in the family and community productive ways. Hunting and fishing, for example, were impacted by the reduction of the territory to areas of pasture, slopes, and plateaus leading the indigenous to obtain essential products through monetary exchanges (LUZ DE OLIVEIRA, 2005; SANTOS, 1997). Despite this, some practices and beliefs specific to their culture can still be seen.

These groups are some examples of traditional communities existing only in northern Minas Gerais. There are many other traditional communities, with their diverse territoriality around Brazil, across the Atlantic coast, across the countryside from North to South of the national territory. To know both the biodiversity conserved and managed by indigenous peoples and also all the cultural wealth that is produced by them, it is essential that appropriate policies to support those groups are implemented to secure the control, access and use of living spaces, where their know-how, myths, rituals, and socio biodiversity have been reproduced from ancient times.

According to Medeiros (2010) when more broadly analyzing the presence of people in the different existing ecosystems, it is necessary to

take into account “the information network that is generated and/or used by the human species, who trace different historical paths from decisions” (2010, p.12). Marques states “this information network consists not only of knowledge generated by interactions between humans and the environment but is also modulated by feelings, beliefs, and behaviors specific to mankind” (2001, p.23). Describing this environmental history of traditional communities is one of the main objectives of ethnosciences, such as ethnobiology and ethnoecology.

The environmental history of traditional communities dates back to the adaptive process occurring over time between groups of humans and nature, with which they interact in a particular space. Such interaction may be intended to supply food, work tools, shelter or housing, among other aspects of nutritional, economic or material importance, as well as possibly also supplying aspects of immaterial, ritualistic or supernatural importance. Knowing this environmental history, according to Medeiros (2010), is of essential importance for any society, since access to this diversity of community memories allows for a reflection on the process of knowledge and use of biological resources through time, from the past and up to the present.

Traditional rural peoples and communities have immense importance in the conservation of biodiversity, not only in Brazil but around the world (GÓMEZ-POMPA; KAUS, 1992). Studies

in ethnoecology contribute to the development of biocultures as represented in northern Minas Gerais in this rich tapestry of rural communities and their traditional territories because they point out the best options for access to and use of nature, as opposed to those that have been promoted and expanded by the hegemonic model of urban-agro-industrial society (DUQUE-BRASIL et al., 2019). Toledo and Barrier-Bassols (2009) call their own ethnoecology as “the use of indigenous and rural peoples knowledge that dates back over thousands of years around the world” (p. 31), in order to rescue the one that modern science has made invisible, that is to say, “the ecology of some 7,000 cultures of indigenous peoples resisting the expansion of the industry, and that support the planet's ecosystems (TOLEDO; BARRIER-BASSOLS, 2009). As Posey (1987) pointed out, those who study traditional knowledge and try to find its modern applications do not propose that the world goes back to the state of tribal existence. There are options for the survival of humanity in the biosphere and many of them are encoded in the “realities” of traditional peoples and communities.

## **Traditional peoples and communities and the struggle for their territories**

Brazilian peoples and traditional communities face several challenges, mainly the difficulty of



recognizing their identity, cultural and territorial rights. They suffer discrimination because of their resistance movement to maintain ties with their landscapes, to maintain their ways of life – and the social, economic and cultural processes that compose them – in a given geographical space, their territory (ALMEIDA; MARIN, 2012; ANAYA; ESPIRITO-SANTO, 2018; PIMENTEL; RIBEIRO, 2016). They challenge the model of development by economic growth from this resistance, which can be expressed in various ways, from the isolation of their communities to direct struggle. This model, which is applied by Brazilian governments in all its spheres (municipal, state, federal), presents a predatory logic of appropriation of material and natural resources and the expulsion – or even the “ethnogenocide” – of any way of life that challenges the ideological and political hegemony of this development model (ZHOURI; LASCHEFSKI, 2010).

Many confrontations or environmental conflicts against the expansion of this type of development into traditional territories have been described involving the northern Minas Gerais communities presented at the beginning of this text. Environmental conflicts are those that occur when there is a disagreement within the spatial arrangement of activities in a city, a region or a country; when the continuation of a type of land use is threatened by the way other activities are spatially developed” (ZHOURI; OLIVEIRA, 2005, p. 62). According to authors such as Luz de Oliveira (2005), Anaya et al.,

(2012) and Araújo (2008), marshlanders and maroon communities of the São Francisco River have survived amid the socio-historical processes of cornering and expropriation of their families, amid the hegemony of the state policy of support for the creation of latifundium since the 19th century and major irrigation projects from the end of the 20th century to the present day. Even so, these populations have adapted over time, both in social and ecological aspects, developing a strategic relationship of coexistence with the environment and the riverbanks of the São Francisco river, in times of drought or floods. Thus, they have maintained ways of using and managing the land and the river since early times with ancestral production techniques, of Indigenous and African origin.

These communities still face the challenge of opposing the state in the environmental policy of protecting Brazilian biodiversity through the creation of Conservation Units of Integral Protection. The debate on its implementation as an option of Environmental Management for Biodiversity Conservation has been developed since the mid-1990s. However, no significant innovations remain, even with the creation of the Extractive Reserves and Sustainable Development Reserves as the option that combines the interests of environmental protection and the sustainable use of nature. These reserves are still minority or exist only in the form of by-laws and without financial resources for their implementation (CARDOSO, 2008; DE FIGUEIREDO; BARROS, 2016).

Traditional territories are historically formed from a process that we can call “territorialization”. Territorialization presupposes symbolic and material ownership and domination of space. In this way, the conditions presented by space (climate, soil, availability of resources such as water, land of culture and minerals) determine the human actions of control and power that lead to the particular ways each society interacts in this space been made into territory. Such ways of social appropriation of the territory are directly related to cultural issues of use and meaning given to space.

There are a number of environmental conflicts in Brazil, which force the “disterritorialization” of the indigenous peoples and traditional communities. Hydroelectric projects, mining, urban expansion, projects and entrepreneurship for reproduction and concentration of capital and even creation of Conservation Units cause the expulsion of thousands of people from their living spaces around Brazil. In the specific context of northern Minas Gerais, the insertion of this region in the scope of capitalist expansion was the trigger to a period of expropriation, de-structuring, and restructuring of traditional lifestyles from the late 1970s when the native vegetation of the Brazilian savanna in the plateaus was replaced by massive eucalyptus and *Pinus*. However, the cycle of socio-environmental degradation and homogenization by the expansion of the capitalist development matrix did not undermine the non-

capitalist logic that prevailed in the region, although it became hegemonic (COSTA, 2006). In this way, the way of life of peasant families and traditional peoples and communities in northern Minas Gerais still survives in “complementarity and sometimes in opposition to the constructive logic of distinct territorialities and social spaces” (COSTA, 2006, p.28).

### **The contribution of ethno-ecology to territorial rights and the conservation of biodiversity**

In the 1970s and 1980s, environmental movements were consolidated, marking the debates on the environmental issue and calling into question a development model that has spread throughout the world, packed by globalization. It was in the 1980s that the notion of sustainable use of natural resources and the recognition of the existence of the “peoples of forests” were consolidated, “that is, the indigenous, riverside, rubber tappers and other traditional groups that became protagonists in the history of overcoming the dichotomy of society-nature and promoting sustainable development” (ZHOURI; LASCHEFSKI, 2010, p.12). From that moment on, a movement that seeks to guide environmental policies that take into account socio-cultural diversity has been gaining strength.

Also in this period, historical works in ethnoecology and ethnobiology began in Brazil,

among others Posey (1987), Chernela (1985) and Cordell (1989) are highlighted. These studies have presented results showing that management of ecosystems by traditional communities has its core on a set of beliefs and knowledge about the use of natural resources based on cultural traditions and the experience of empirical variations in the surrounding environment. Riverside and marshland communities of the mid São Francisco river in Minas Gerais, for example, depend directly on the variations of the environmental cycles and the bioecology of natural resources. They maintain an intimate association with the aquatic and terrestrial ecosystems of the São Francisco River Basin, developing knowledge and understanding that are indispensable for their survival, either by agro-extractivism or by marshland agriculture, or by fishing (THÉ, 2003). Ethnoecology is essentially the study of this accumulated knowledge, of the conceptions developed by any human society regarding nature and the different uses and ways of management of natural resources (ALBUQUERQUE, 2014; MARQUES, 1995; TOLEDO, 1992).

It is therefore desirable that the proposals for environmental management and territorial planning incorporate traditional knowledge and practices, as well as ensuring that users, such as artisanal fishers, traditional extractive communities, among others actively participate in the decision-making and normative processes on the use of natural resources. Berkes et al.

(2001) refer to this procedure as “community-based management”, a resource management process, dynamic throughout time, involving aspects of democratization, social “empowerment”, equitable power, and decentralization.

The traditional peoples and communities of northern Minas Gerais have shown a “universe” of knowledge, management practices and ethical values that have contributed to the conservation of threatened natural resources, such as those belonging to the Brazilian savanna biome, of which only 20% remain in its original conditions. Fishers, marshlanders, *geraizeiros*, among others have an understanding of wildlife ecological, migratory and food behaviors, which often surpasses the scientific detail about such behaviors. They also discern with acuity the habitats, living areas and reproductive periods, among other aspects of the biology of terrestrial and aquatic animals. They use fauna for food, medicinal, commercial and even ritualistic purposes. As for botanical knowledge, it is usually more comprehensive than knowledge about fauna. Traditional knowledge refers even to the genetic improvement of species considered to be of greater importance, especially those cultivated for food or of greater economic value. They include the operation of river hydrological cycles and specific planting and harvesting seasons suitable for the semi-arid region, which includes northern Minas Gerais (ANAYA et al., 2012 ARAÚJO, 2012; DAYRELL, 1998; LUZ DE OLIVEIRA, 2005; THÉ, 2003).

These groups have been reporting through online movements the threat to regional socio-biodiversity due to the expansion of agriculture and the "accidental" contamination (for the most part deliberate and criminal) of organic crops by Genetically Modified Organisms (GMO). Also, due to climate change, as explained by the lengthening of the dry season and the consequent increase of water shortage in the semi-arid region of Brazil. Mining companies have as well been a huge threat to the territories of these traditional communities. All these threats are on the agenda for public policies to protect the "biocultural" heritage of the Brazilian savanna and other Brazilian biomes.

The communities also criticize the development policies implemented by the Brazilian government, which focused mainly on rural areas, expansion of agribusiness, forestry and power generation through the construction of dams and hydroelectric power plants, and sugar cane and soybeans plantations for biodiesel fuels, which are threatening the future survival of their identity, their land and their traditional ways of life ([COMBATE RACISMO AMBIENTAL, 2013](#), [CARTA..., 2015](#)).

This set of knowledge, practices, and beliefs accumulated by indigenous peoples comes to question the maintenance of a model for management of natural resources in Brazil, which is centralized in the hands of the State with little or no involvement of local communities regarding management planning and protection of the diverse ecosystems. Even when its

proposals seem to meet policies already established by the state through laws and programs, effective implementation is a great challenge. An example of this is the struggle for the creation of extractive reserves and reserves of Sustainable Development in the Brazilian savanna. There are eight reserves being claimed for about 10 years in northern Minas Gerais and only one was created by the responsible agency in Brazil, ICMBio (Chico Mendes Institute for Biodiversity Conservation), in 2014, on the eve of the presidential elections: the Reserve for Sustainable Development *Geraizeiras* Springs ([BRASIL, 2014](#)).

## Final considerations

In a country with high occurrence of disputes on rights over natural resources, as well as cases of environmental injustice involving rural and traditional communities, it is evident that the development projects based on the model of economic growth put the resilience of socio-ecological systems at risk. That is to say, its ability to handle disturbances or to adapt to new stability conditions such as climate change, economic crises, and environmental degradation through the implementation of major development projects like hydro-electric dams, irrigation, and mining, among others. In addition to the economic, cultural and ecological impacts on peoples and their traditional territories, conflicts are raging, mainly between communities and government institutions,

imposing a huge challenge to environmental management.

Understanding how traditional peoples and communities relate to their living environment, whether by producing conceptions and “ethnotaxonomies”, or by managing biological diversity through local rules that determine the ways of access and use of nature can and should contribute to the development of fairer and more equitable public environmental policies for traditional populations and the conservation of socio-biodiversity. This contribution would be the materialization of the maintenance of traditional territories and different biocultures, as well as the resolution of various environmental conflicts in northern Minas Gerais, in other areas of Brazil and around the world.

There must be a change of values and postures for the recognition of the different cultures and ecological knowledge in Brazilian environmental management. This will also mean extending to different traditional groups the possibility of deciding the directions of the development model to follow, assuring rights to citizens who have long opted for other models, focusing on the community, local environmental history, justice and, above all, the sustainability of social biodiversity.

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