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Papers

Ecosociosystem Landscape of the Sustainable Development Reserve of Quilombos de Barra do Turvo, São Paulo

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Abstract
In the ecosociosystem landscape, traditional practices and customs are employed by quilombola communities in the use and manage of the land, constituting essential characteristics for the conservation of local sociobiodiversity. Thus, the objective of this study is to analyze the landscape used and managed by quilombola communities in the Sustainable Development Reserve of Quilombos de Barra do Turvo in São Paulo, discussing its implications for its conservation status. Geotechnological tools were used to generate maps and quantifiable data on vegetation cover and land use for the years 1984 and 2020. as well as the Anthropogenic Transformation Index to identify the conservation status of the landscape. In the Reserve, as well as in quilombola communities, anthropogenic uses predominated, specifically agriculture and livestock farming. In terms of vegetation cover, the extent of the Dense Montane Ombrophilous Forest showed a reduction in both investigated areas. Water within the Reserve showed an increase in area, while there was no spatial change in the communities. The conservation status of the landscape in the Reserve and quilombola communities, on both investigated dates, was found to be mildly degraded. It was concluded that there is a need for the development of management plans that respect the way of life of quilombola communities and the maintenance of aquatic and terrestrial fauna and flora, contributing to the conservation of the local landscape.

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INTRODUCTION

The actions of society over time occur in distinct ways, just as the conception of the environment varies according to the culture of each social group, influencing how they relate to their geographic space. Specifically, the relationship of traditional peoples with nature is established within societies, as are social relationships. This relational unity of humans with nature is characterized by reciprocal influence, where humans transform their surroundings while being transformed themselves, shaping different forms of ecosystem organization. From a Marxist perspective, this unity is considered universal because it is an ontological condition; that is, humans can only produce themselves in relation to nature, wherein there is a process of humanization of nature and simultaneously the naturalization of humans (Peto; Verissimo, 2018).

Thus, human relations with nature are considered self-regulating and self-determining systems aimed at increasing energy efficiency or productivity, nutrient cycle efficiency, organization, and stability (Margaleff, 1968. cited in Diegues *et al*., 2000). From this perspective, living beings maintain equilibrium, or homeostasis, through a series of mechanisms that allow them to adapt to nature. According to Diegues (2008, p. 79), the term adaptation refers to:

> [...] a mechanism by which organisms or groups of organisms, through sensitive transformations in their states, structures, and compositions, maintain a homeostatic state during short-term environmental fluctuations and long-term transformations, within the composition and structure of the environment.

In light of the above, to understand how humans use and manage land and their interactions with the biotic and abiotic elements of the landscape, it becomes necessary to adopt a systemic approach. This approach presupposes a set of interacting elements forming a whole that allows the emergence of human-nature relationships, including their organization and dynamics, while also identifying the challenges faced.

In this context, ecossociosystems are formed, which are related to "actions aimed at the effective management of natural environment quality, based on an adaptive relationship between humans and their environment" (Ollagnon, 2002, p. 175). In other words, it emphasizes understanding the interrelation and interdependence of humans with nature, highlighting their adaptations in the landscape.

In this perspective, traditional peoples, through their knowledge, have adapted social and environmental systems. This is precisely why the landscape is seen as an integrating unit, resembling a heterogeneous mosaic formed by interactive units. Understanding the evolutionary dynamics of the landscape, as a product integrated and shaped by human relationships with their environment, Bertrand (1968, p. 250) proposed that "landscape should not be understood as a simple addition of disconnected geographical elements but as a result of dynamic combination" — thus, the relationship between biophysical and anthropogenic components exhibits instability. Therefore, the ecossociosystemic landscape can be conceived as a product of the relationships between society and nature; and due to the dialectical interaction among its components, it becomes a unique and inseparable entity, evolving over time and space (Bertrand, 2004, p. 141).

The Reserva de Desenvolvimento Sustentável de Quilombos de Barra do Turvo (RDS-QBT - a natural area that is home to quilombola communities whose existence is based on sustainable land use and management systems) is home to traditional peoples who rely on sustainable systems for using natural components of the landscape, developed over generations and adapted to local ecological conditions. They play a crucial role in environmental protection and the maintenance of biodiversity in the Vale do Ribeira region, in accordance with Article 20 of Law No. 9.985/2000 (Brasil, 2000).

Among the methods for measuring landscape transformations over time, geotechnologies have emerged as crucial tools. These technologies enable the acquisition, manipulation of spatial and temporal data, and integration of various data formats (raster, vector, and tabular), such as satellite imagery and census data. Currently, to monitor the induced and accelerated transformations, partly driven by humans, monitoring systems based on remote sensing images of the Earth play a key role. These systems continuously image the Earth and are essential for supporting environmental monitoring, policy development, management, planning, and decision-making processes (Gomes *et al*., 2022).

Therefore, this study aims to analyze the landscape used and managed by the quilombola communities located in the RDS-QBT, São Paulo.

It will discuss the implications for its conservation status.

MATERIALS AND METHODS

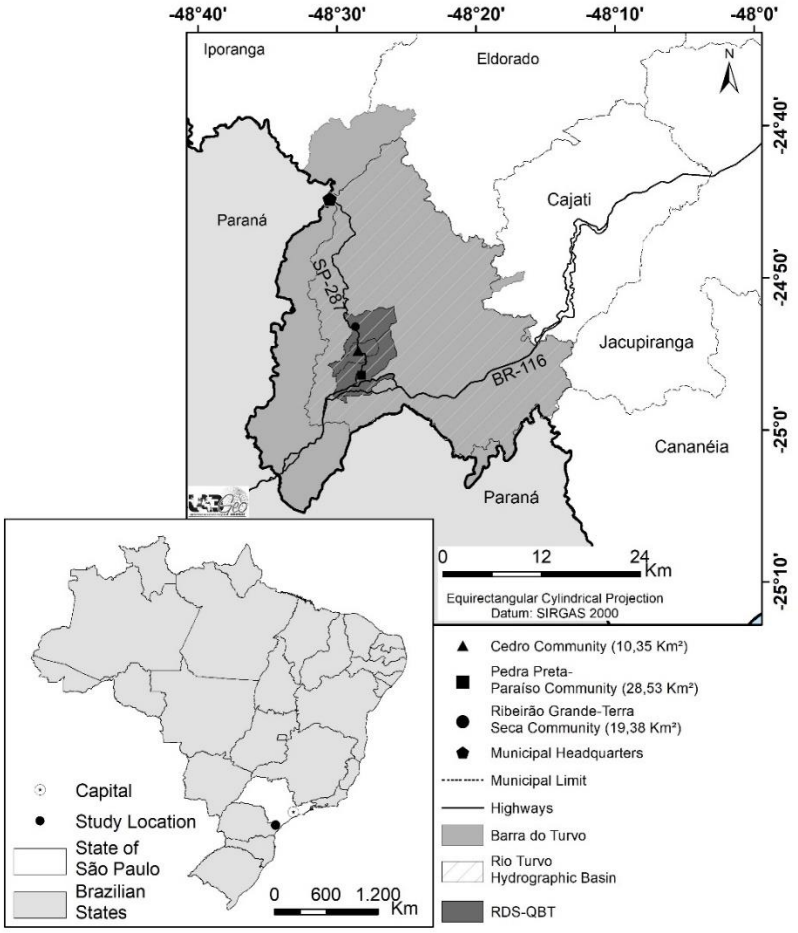
Characterization of the study area

The formation of the RDS-QBT was due to the establishment of the Parque Estadual de Jacupiranga (PEJ - environmental protection area, occupied by various traditional peoples) in 1969. based on ecological and socio-economic criteria. Several municipalities, including Barra do Turvo/SP, were included in the process of creating the Park, totaling 1.500 km2 of Conservation Units. The Park area encompassed various traditional groups (indigenous peoples, quilombolas, caiçaras, and caboclos) and non-traditional groups, as well as one of the most important highways in the country, the Régis Bittencourt (BR-116) (Giacomini, 2010; Bim, 2012).

After a long process of negotiations between civil society and the government of São Paulo state, there was an achievement in the possibility of reclassifying these Conservation Units, transforming them into the Jacupiranga Conservation Units Mosaic in 2008 (Bim, 2012). This reclassification action led to some conservation-related conflicts, such as the maintenance of forested areas and water sources, sustainable land use by indigenous and traditional peoples, and the interests of farmers. However, the implementation of environmental management and the establishment of agreements with the local population contributed to conflict reduction (Bim, 2012).

Specifically, the RDS-QBT constitutes a mosaic covering 58.28 km2, encompassing the following quilombola communities: Cedro, with a territorial extension of 10.35 km2 and comprising 23 families; Ribeirão Grande-Terra Seca, covering 19.38 km2 with 77 families; and Pedra Preta-Paraíso, spanning 28.53 km2 with 80 families, whose ancestors have occupied the area for over 300 years (Figure 1).

Figure 1 – The RDS-QBT holds significance at national, state, and municipal levels, emphasizing the location of quilombola communities



Source: The authors. (2022).

Methodological procedures

For the years 1984 and 2020, images from Landsat 5 satellite, Thematic Mapper (TM) sensor, and Landsat-8 satellite, Operational Land Imager (OLI) sensor, were used from orbit/point 220/77. Both datasets have a spatial resolution of 30 meters. Landsat 5 satellite images were obtained free of charge from the website of the Instituto Nacional de Pesquisas Espaciais (INPE - institution that carries out research, development and services related to space science and technology), while Landsat-8 satellite images were freely available on the website of the United States Geological Survey (USGS, 2021). The criterion for selecting the images was the least cloud cover over the study areas.

The image processing was carried out using the Georeferenced Information Processing System (Spring), version 5.4.3 (Câmara *et al.*, 1996). The cartographic parameters adopted in the creation of the Geographic Database (BDG) were: SIRGAS 2000 Datum, metric coordinate system, and Zone 22 South.

The 2020 Landsat 8 satellite image was used in two distinct stages: the first involved registering scenes from the Landsat 5 satellite image using the Screen-to-Screen method, and the second stage encompassed the development of the 2020 land cover and land use map. Both images were clipped using the vector file of the study areas.

Segmentation of the scenes from each date was carried out using the Region Growing method, and the Classification stage involved Training, where samples of each class were selected for the GIS to create polygons. For sample selection, according to Florenzano (2011), the following criteria can be adopted: color, shape, location, pattern, and texture. For the execution of the second classification stage, the approach proposed by Neves *et al.* (2019) was chosen, utilizing parameters such as the Bhattacharyya Classifier and an acceptance threshold of 99.9%. Finally, matrix-vector conversion was performed.

The vector files (.shp) of vegetation cover and land use for 1984 and 2020 were exported to conduct subsequent methodological phases in ArcGIS, version 10.7.1 from the Environmental Systems Research Institute (Esri, 2019). In the ArcMap module, adjustments were made to the polygons of thematic classes, map layouts were created, and the areas in km² of each class were quantified in the mappings for each date.

The validation of vegetation cover and land use maps was conducted using cartographic data generated by the Instituto Brasileiro de Geografia e Estatística (IBGE - the institute responsible for producing and disseminating statistical information on the Brazilian population) and fieldwork. The landscape of the study areas was documented through photographs taken with digital cameras and Unmanned Aerial Vehicles (UAVs), with the photograph locations georeferenced via GPS. Validation took place following approval from the Research Ethics Committee of Universidade Federal do Paraná (UFPR - brazilian institution of teaching, research, extension and culture) (Opinion No.: 4.196.750 and CAAE Registration: 30452220.9.0000.0102), the Comissão Técnico Científica do Instituto Florestal (COTEC - institute responsible for researching, protecting and conserving the biodiversity of natural areas in the state of São Paulo, process No.: 003837/2020-65), and the investigated communities.

For the calculation of the Anthropogenic Transformation Index (ITA), the procedures described by Mateo (1991) and Leandro and Rocha (2019) were adopted, using the percentages of area that each land cover and land use class totaled on each investigated date, applying the equation:

$$ITA \rightleftarrows = \sum(\%use \times weight)/100 \quad (1)$$

Where:

Use: Percentage values that each of the vegetation cover and land use classes occupied on each of the dates used;
Weight: Weights assigned to each class, ranging from 1 to 10. used to identify the degree of landscape alteration, where classes with higher weights contribute more significantly to landscape change (Dassoler *et al.*, 2018).

In Table 1, the categories, vegetation cover classes, land use types present in the study area, and their respective weights are presented.

Table 1 - Weights assigned to vegetation cover and land use classes.

Categories	Classes	Weights
Anthropic uses	Agribusiness	5.00
	Urban Influence	9.70
	Secondary Vegetation without Palms	1.00
Vegetation cover	High-Montane Dense Rainforest	1.00
	Montane Dense Rainforest	1.00
Water bodies	Water	2.00

Source: The authors (2022).

The conversion of quantitatively measured anthropogenic pressure values in the landscape to qualitative classes was carried out using the quartile method, adopted by Cruz *et al.* (1998) and Rodrigues *et al.* (2021): slightly degraded (0 – 2.5), moderate (2.5 ┤— 5), degraded (5 ┤— 7.5), and highly degraded (7.5 ┤— 10).

In this study, the state of "slightly degraded," as defined by Rodrigues *et al.* (2022), refers to areas where natural vegetation of good quality is present, covering the soil partially or entirely. These areas are crucial for environmental maintenance and stability, supporting natural cycles and contributing to the availability and quality of water resources. This classification implies that pressures or transformations are less intense, without significant alterations to the ecosystems' material and energy cycles. However, if uses and management practices are not conducted in a rational manner, allowing for the maintenance of recycling of chemical, physical, and biological elements within their environment, the conservation status of the landscape will be unfavorably altered. The damages caused to its components could be irreversible.

RESULTS AND DISCUSSIONS

Dynamics of vegetation cover, land use, and landscape conservation state in the RDS-QBT

Anthropic use has shown greater dynamics and caused changes in the landscape of RDS-QBT since its formation, which began with the construction of the PEJ in 1969. This encompassed various social groups (both traditional and non-traditional) with differentiated ways of using and managing the land. Although these actions contributed to the reduction of agricultural activities, they led to increased urban influence and the presence of secondary vegetation during the study period (Table 2).

Table 2 – Vegetation cover and land use in RDS-QBT.

Categories	Classes*	Areas				Dynamics
		1984		2020		
		km²	%	km²	%	
Anthropic use	Ap	43.64	18.65	37.04	15.81	-15.12
	Iu	0.43	0.18	0.56	0.24	29.84
	VegS+Sp	26.21	11.19	65.82	28.09	151.13
Vegetation cover	FloO+Am	3.53	1.51	3.80	1.62	7.52
	FloO+Dm	159.63	68.12	125.83	53.70	-21.17
Water Bodies	Water	0.88	0.38	1.27	0.54	43.57
Total		**234.32**	**100**	**234.32**	**100**	**-**

Legend: Classes*: Agribusiness (Ap), Urban Influence (Iu), Montane Rainforest (FloO+Am), Montane Dense Rainforest (FloO+Dm), Secondary Vegetation without Palms (VegS+Sp).
Source: The authors (2022).

The RDS-QBT comprises 180 quilombola families distributed across three communities, along with non-traditional farmers. Bernini (2015) explains that migration to the region where RDS-QBT was established is linked to the decline of gold mining in Alto Ribeira, which occurred in the late 17th century, and to the escape, liberation, or abandonment of enslaved individuals from mining activities. Additionally, another significant factor relates to the disintegration and decline of monoculture

systems developed on large estates and reliant on enslaved labor.

These migrations led to a revaluation of the region, directly affecting the previously present quilombola communities by largely restricting their traditional forms of land use and management (Bernini, 2015). Situations like these contributed to adaptations in the way of life of quilombola communities, which can be understood as a result of interaction between different social groups and new techniques of land use and management, following environmental restrictions imposed by the recategorization of RDS-QBT.

In light of the above, it is worth mentioning that in 1940, some of the oldest quilombola families lost their lands to farmers. In the following decade, the Itaoca estate from Paraná presented itself as the owner of the lands that now encompass RDS-QBT. The expropriation process involved a series of information discrepancies among the quilombola communities, the State, and the property owners in the estate area (Bernini, 2015). According to the same author, cases of expropriation corroborated the idea that conservation policies, resulting from relationships and processes anchored in the establishment of private property, facilitated business transactions centered around land income, due to the payment of substantial compensation for the area.

In addition to these facts, the construction of the Regis Bittencourt highway (BR-116) in 1961 led to an increase in people interested in acquiring land in the Vale do Ribeira region (Barra do Turvo/SP), thereby influencing the dynamics of land appropriation. According to Bernini (2015), with the construction of the highway, some quilombola families, particularly from the Pedra Preta-Paraíso community, were separated. This separation made it difficult for them to access established agricultural areas and forced these families to settle in restricted and hard-to-reach areas. This latter fact likely contributed to the increase in secondary vegetation and the reduction of agriculture (Table 2).

Therefore, quilombola families resist and are constantly adapting and reorganizing themselves amidst the social and political struggles to maintain the space conquered by their ancestors. It must be considered that often throughout the history of occupation and the establishment of RDS-QBT, quilombola families have been marginalized or made invisible. Hence, their daily life involves constant struggle and resistance, whether for recognition, social equality, regularization of their traditionally occupied lands, or valorization of their way of life, all of which contribute to the conservation of natural landscape components. This landscape is shaped by their traditional practices and customs that utilize natural attributes.

Regarding the dynamics of Agribusiness in RDS-QBT, there was a reduction in its area during the analyzed period (Table 2), which can be attributed to the development of environmental projects or the implementation of management plans. It is considered that these plans incorporated land use and management techniques as one of the recommendations following the recategorization of RDS-QBT. Thus, the adoption of agroforestry systems, involving the diversification of plants with different growth cycles and the use of heirloom seeds, has enabled the diversification of food production throughout the year. However, it's important to note that these agroecological practices are primarily developed by quilombola communities, whereas farmers predominantly engage in livestock farming (Rodrigues, 2022).

The Urban Influence (cities) class showed expansion (Table 2), which may be related to the increased occupation of the Vale do Ribeira region, in terms of land appropriation by farmers and the growth of the quilombola population in the RDS-QBT. In this case, it may be associated with the descendants remaining in the region. However, the conservation of the landscape was maintained, with few changes occurring over the years.

The increase in Secondary Vegetation without Palm Trees (Table 2) contributed to the development of the management plan and the implementation of mitigating measures, aiming to reduce negative impacts, partially developed by the farmers, as it is an environmental protection area. The removal of natural vegetation cover for the implementation of anthropogenic activities, such as agriculture and livestock, can hinder the forest regeneration process. In this case, monitoring and supervision in the RDS-QBT are fundamental measures for controlling the transformations that can cause degradation to the biotic and abiotic attributes of the local landscape.

In the Vegetation Cover category, the Upper Montane Dense Ombrophilous Forest increased in area (Table 2). Forests situated at high altitudinal levels are subject to strong climatic restrictions (Dreyer et al., 2020), highlighting areas unsuitable for agricultural development. Meanwhile, the Montane Dense Ombrophilous Forest decreased (Table 2) due to anthropogenic activities carried out by the local population, specifically farmers who use their areas with unsustainable practices for agriculture. Often, human intervention promotes the suppression of

vegetation cover, reducing the capacity to produce ecosystem services (Ferreira *et al*., 2015), causing various forms of disturbance and degradation, which hinders the successional process of the vegetation (Seoane *et al*., 2023).

Finally, the Water Bodies category, consisting of the Water class, showed a growth dynamic (Table 2), indicating that the increase in the Upper Montane Dense Ombrophilous Forest contributed to the growth of this class, as they occur in rugged terrain where the springs are located.

It is worth noting that hydrological cycles are affected by natural transformations and those developed by human actions, such as the excessive use of aquifers for supply or irrigation, suppression of natural vegetation, mining, burnings, deforestation, among other factors (Young *et al*., 2015; Mendes *et al*., 2021). Many of the actions mentioned are carried out for the implementation of agricultural systems.

The conservation status of the RDS+QBT landscape remained slightly degraded over the analyzed period (36 years), although its indices changed from 1.36 in 1984 to 1.65 in 2020. Despite these changes, the category remained the same.

The quilombola way of life is partially characterized by the practices of land use and management in the RDS-QBT, a space responsible for providing means of subsistence, work, and production, as well as producing the material aspects of social relations, that is, those that make up the structure of a society (kinship relations). According to Diegues (2008), this space represents not only the physical environment but also the place where their ancestors lived, a collective space in which their way of life, distinct from the urban-industrial, is realized. In this context, quilombola communities contribute to the maintenance of natural cycles and, consequently, to the balance of the ecosystem, which allows for the existence, permanence, and interaction among various species of aquatic and terrestrial plants and animals, thus forming a mosaic of ecosocioeconomic landscapes.

The presented data indicate that monitoring the landscape and overseeing it by the managers in RDS-QBT is necessary. However, this is hampered by the lack of a team composed of professionals from different fields of knowledge and the lack of geotechnological tools, resulting in limited oversight and control services.

Dynamics of Vegetation Cover, Land Use, and Landscape Conservation in Quilombola Communities

Agriculture and livestock farming showed high dynamics in the three communities investigated (Table 3) due to the presence of farmers within the areas. This is attributed to the territorial occupation process in the Vale do Ribeira region, where these farmers directly contributed to the increase in anthropized areas through their activities.

In the communities, the diversification of agricultural activities through crop cultivation, animal husbandry, and forestry constitutes an important practice for organic and agroecological-based production.

Table 3 – Vegetation Cover and Land Use in 1984 and 2020 by Communities

Communities	Categories	Classes*	Area				Dynamics
			1984		2020		
			km²	%	km²	%	
Cedro	Anthropic Use	Ap	0.18	1.75	0.38	3.66	109.06
	Vegetation Cover	VegS+Sp	3.64	35.13	5.99	57.90	64.81
		FloO+Dm	6.53	63.12	3.91	37.77	- 40.16
	Water Bodies	Water	-	-	0.07	0.76	-
	Total		**10.35**	**100**	**10.35**	**100**	**-**
Ribeirão Grande-Terra Seca	Anthropic Use	Ap	1.05	5.40	2.01	10.35	91.76
		VegS+Sp	1.39	7.19	3.35	17.29	140.40
	Vegetation Cover	FloO+Dm	16.94	87.41	13.93	71.89	- 18.35
	Water Bodies	Water	-	-	0.09	0.47	-
	Total		**19.38**	**100**	**19.38**	**100**	**-**
Pedra Preta-Paraíso	Anthropic Use	Ap	4.03	14.14	7.04	24.69	74.57
		VegS+Sp	3.48	12.21	8.21	28.76	135.56
	Vegetation Cover	FloO+Am	0.25	0.86	13.12	45.97	- 69.55
		FloO+Dm	20.77	72.79	8.21	28.76	- 36.84
	Water Bodies	Water	-	-	0.09	0.26	-
	Total		**28.53**	**100**	**28.53**	**100**	**-**

Legend: Classes*: Agriculture (Ap), Upper Montane Dense Ombrophilous Forest (FloO+Am), Montane Dense Ombrophilous Forest (FloO+Dm), Secondary Vegetation without Palm Trees (VegS+Sp).
Source: The authors (2022).

The ancient practice of slash-and-burn agriculture by quilombola communities, using heirloom seeds associated with agroforestry systems and vegetable production, contributes to the diversification of food for the subsistence of the communities. These production techniques promote the use of organic fertilizers, helping to reduce pests and diseases; and the use of natural fertilizers provides nutrients to the soil (Altieri *et al*., 2003). The planning of the production system, for example, with the agricultural calendar associated with various previously described techniques, supports food diversification in the short, medium, and long term, along with family income and the maintenance of production units.

The Secondary Vegetation without Palm Trees in the three analyzed communities showed an expansion dynamic in the occupied area, being greater in Ribeirão Grande-Terra Seca (Table 3). Several factors may have influenced this, such as the location of the communities, the number of farmers among them, the number of families, and anthropogenic activities like agriculture and livestock farming.

In this way, it is important to highlight that studies of this nature and in these spaces contribute not only socio-economic information but also data on local landscape changes, which can be used for planning and management development. In this context, the plurality of knowledge expressed in local management provides cultural values and environmental conservation.

The dynamics in the Upper Montane Dense Ombrophilous Forest showed a reduction in the Pedra Preta-Paraíso community and growth in the others, while there was a reduction in the Montane Dense Ombrophilous Forest across all three communities (Table 3). This situation reinforces the need for the development of a management plan in the RDS-QBT, considering the quilombola communities and aiming at the maintenance and conservation of the natural components of the landscape. In this context, it is worth noting that natural vegetation, according to Alarcon *et al*. (2016), produces various ecosystem services, such as carbon sequestration, protection of water bodies, maintenance of riparian forests, conservation of biodiversity of fauna and flora, among others. Additionally, it provides other uses for humans, such as medicinal and aromatic use, food, resins, waxes, raw materials for crafts, among other benefits.

It also highlights the forest-culture relationship, meaning the significance of the forest for quilombola communities. This connection materializes in the Atlantic forest fragments of the southeastern region of the country, which is important for rescuing and valuing African-origin culture, as well as for developing studies aimed at plant conservation and deepening the analysis of the methods adopted by quilombolas for maintaining local species' biodiversity and their cultural historicity. Thus, the incorporation of quilombola values and knowledge in forest use and management

promotes the empowerment of the studied communities. This stance is neither unanimous nor hegemonic in society, as some institutions develop sectoral actions, disregarding the perspective of traditional peoples as social and ecological variables in the construction of environmental plans and actions (Del Rio; Oliveira, 1996).

The Water Bodies in the three communities did not show any changes in dynamics (Table 3), supporting the understanding that quilombola communities are considered guardians of water bodies due to their occupation process around rivers and islands. Therefore, the quality and quantity of this component are essential for the survival of these populations. Despite the presence of farmers in the RDS-QBT, the communities' efforts to conserve water have shown satisfactory results.

In this context, there are several challenges faced in guiding productive processes and proposing economic development strategies together with traditional communities, which are capable of contributing to minimizing environmental impacts in various spaces. At the same time, these strategies should aim to be socially just and conserve water components and sociocultural diversity (Caporal, 2009; Caporal; Costabeber, 2002).

The conservation status of the landscape in quilombola communities is slightly degraded, with Pedra Preta-Paraíso showing the highest value on both dates analyzed (Table 4). This may be due to the socio-environmental implications of the RDS-QBT, its location relative to the Regis Bittencourt highway, the large number of families, and its territorial extension, which is the largest of the three communities.

Table 4 – ITA in Quilombola Communities of RDS-QBT in 1984 and 2020

Communities	1984	2020	State of the Landscape
Cedro	1.07	1.15	
Ribeirão Grande-Terra Seca	1.22	1.42	Slightly degraded
Pedra Preta-Paraíso	1.57	1.99	

Source: The authors (2022).

Given the above, the presence of quilombola communities in the RDS-QBT serves as a form of resistance to the predominant agricultural production model in the RDS-QBT, which forced them to readapt, reorganize land use and management practices, and seek new production techniques that promote balance and landscape conservation. This society-nature duality is present in the quilombolas' way of life, evidenced by their respect for and understanding of the landscape's attributes, the care and maintenance of forests, and the preservation of ancestral techniques and customs in agricultural practices—elements that characterize, distinguish, and define their ethnic identity.

FINALS CONSIDERATIONS

In the RDS-QBT, the relationship between society and nature is not limited to land use and the management of natural landscape components but is also a result of the specific ways of life of traditional and non-traditional peoples who inhabit this space. This situation stems from land tenure issues and land demarcation.

Regarding the quilombola communities, the transformations in the landscape result from their way of life, techniques, knowledge, and customs through daily practices. In this relationship where the social evolves with the natural, they produce a metabolic and ecological connection, contributing to the formation of the ecosocioeconomic landscape.

There is a need for planning and developing management plans to conserve landscape attributes, aiming at the maintenance of fauna and flora (both aquatic and terrestrial), and the constitutional rights of quilombola communities.

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Luciene da Costa Rodrigues: Conceptualization, Data curation, Data analysis, Map generation and Writing the original manuscript.

Sandra Mara Alves da Silva Neves: Generation of maps and Writing/Revision of the original manuscript.