



# Territorial Planning and Sustainable Development: A Case Study from the APA São Francisco Xavier-SP

Raquel Henrique<sup>I</sup>  
Maria Angélica Toniolo<sup>II</sup>

 <sup>I</sup> Universidade do Vale do Paraíba (UNIVAP), São José dos Campos, SP, Brasil.

 <sup>II</sup> Universidade do Vale do Paraíba (UNIVAP), São José dos Campos, SP, Brasil.

**Abstract:** This article is a case study from the APA São Francisco Xavier, located in the municipality of São José dos Campos-SP, and aims to evaluate the effectiveness of this UC category as an instrument of territorial planning to fulfill its role of reconciling conservation and socio-economic development, based on the sustainable use of natural resources. This study applied multi-methods - both qualitative and quantitative approaches - using fieldwork, participant observation, questionnaires, and geoprocessing to collect and analyze both primary and secondary data. The results demonstrate that APA promotes conservation, but is not free from threats and does not have effective and permanent means to guarantee the promotion of socio-economic development based on the sustainable use of its natural resources. The study suggests that territorial planning should be articulated between the levels of government, its different agencies, and the local community.

**Keywords:** Protected Area (PA); São Francisco Xavier (SFX); Conservation; Sustainable Development; Territorial planning.

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## Introduction

One of the challenges posed for the 21st century is to understand what sustainable development can be, whether it can be achieved, and what the acceptable trade-offs between its different dimensions are, given the deepening of the complexity of current social and productive relations.

Since this term was coined in 1987, in the Our Common Future report (Brundtland Report), as a systemic approach to development that goes beyond the economic dimension, there are still controversies around the meaning of sustainable development due to the complexity of the problems involved (LÉLÉ, 1991), implementation difficulties (ADAMS, 2009) and different ideological orientations (SODERBAUM, 2018).

The Convention on Biological Diversity (CBD) defines protected areas as an important instrument for conservation. One of the global goals, defined by the Aichi Targets, to which Brazil is a signatory<sup>1</sup>, was to reach 17% of protected land and continental areas in the world by 2020, meeting international goals on biodiversity. The protected area (PA) is a national name for territories established to protect or conserve natural heritage, including cultural resources that also exist, using specific legal and/or institutional instruments (BRITO, 2008). Despite its late initiative to protect natural resources compared to other Latin American countries, Brazil expanded the creation of new forms of protection based on the *Sistema Nacional de Unidades de Conservação* (SNUC) (National System of Conservation Units) (MEDEIROS, 2005).

The SNUC is composed of 12 categories of *Unidades de Conservação* (UC) (Conservation Units), classified according to the permitted uses and management: the Integral Protection UCs, which admit only indirect use, without involving use or damage, and the Sustainable Use UCs, allowing the use reconciled to environmental conservation (BRASIL, 2000).

However, SNUC is constantly criticized regarding its effectiveness (BRITO, 1998). Among the main limitations in promoting sustainable development are problems related to land title regularization, the insufficient technical team appointed for its coordination, execution, and inspection, the fragile infrastructure (when existing), and the lack or inexistence of a management plan for each UCs. The UCs can be created at the federal, state, as well as at municipal levels, and when combined with protocols of international intentions, such as the CBD and Agenda 2030, they seek to develop an effective network of protected areas in the country.

Despite the challenges, the creation of PAs in Brazil has become one of the main instruments of environmental governance for the preservation of biodiversity and other environmental services crucial to life, such as the maintenance of carbon stocks, climate regulation, and the water supply (VALLEJO, 2002). Thus, studies on these instruments are essential for understanding the national territory, as well as the planning policies that take place in these spaces (VALLEJO, 2002).

1 - On Brazil's adherence to the Aichi Targets: <https://www.mma.gov.br/informmma/item/15257-cop-14-brasil-adere-%C3%A0-declara%C3%A7%C3%A3o-para-protoger-habitats.html>

The UCs of sustainable use have been the main responsible for the expansion of protected areas in the country. The Área de Proteção Ambiental (APA) (Environmental Protection Area) is perhaps the most complex UC category (MORAES, 2011), in the sense of implementation and jurisdiction, as it is generally large areas, endowed with a certain degree of occupation, encompassing public and private lands, whose objective is to order the occupation process, protect biological diversity and guarantee the sustainable use of natural resources. Thus, reconciling the various economic activities that take place in the territory of an APA with specific managements, which are less harmful to the environment, is one of the main challenges of this category of UC.

In this sense, given the complexity of this UC category and its growing popularization, the article aims to assess the effectiveness of the APA as a territorial planning instrument capable of fulfilling its role of reconciling environmental conservation with socio-economic development, based on sustainable use of natural resources.

This work recognizes that the challenge of territorial planning is inherently a complex management of different resources, therefore, reconciling environmental conservation with socio-economic development is not trivial. It is a complex task, which depends not only on institutional advances but also on the arenas of participation that are established in the territory, in which negotiations, tensions, and social and political disputes among the different actors involved take place.

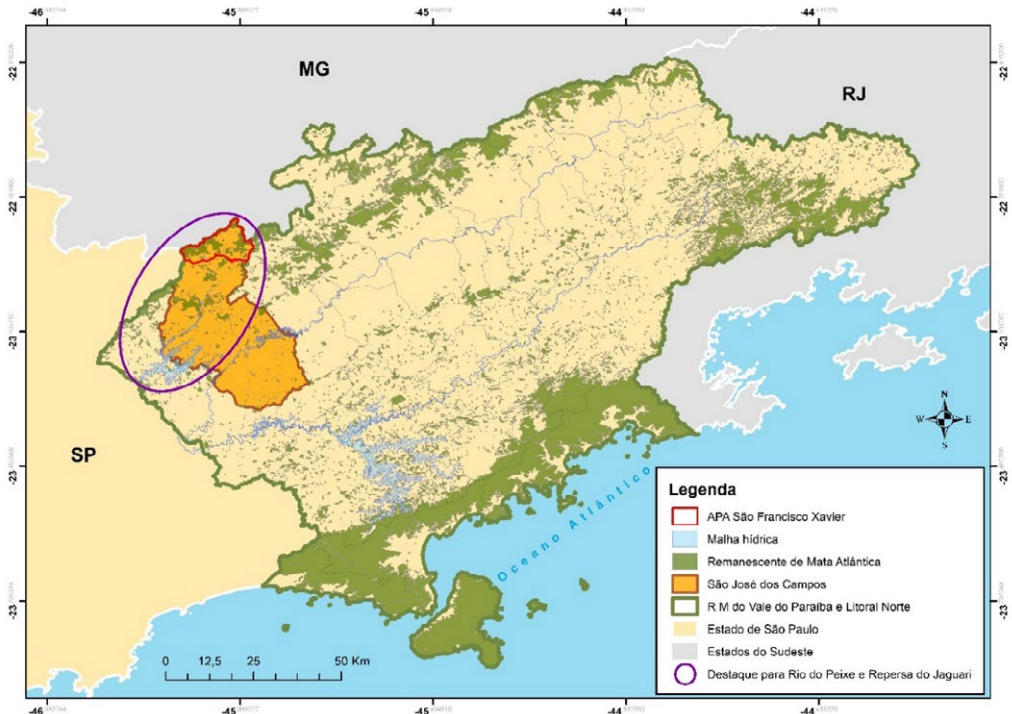
### **History of occupation and economic activities at APA São Francisco Xavier**

The APA São Francisco Xavier (APA SFX) is located in the municipality of São José dos Campos (SJC), state of São Paulo, occupying part of the territory of the district that gave it its original name, São Francisco Xavier (Figure 1). In this UC there is a jurisdictional overlap of APAs, being municipal by Law 4212 (SJC, 1992), state by Law 11.262 (SÃO PAULO, 2002), and federal by Decree 87.561 (BRASIL, 1982), reaffirming the environmental importance of the territory. However, both the municipal and the federal APAs do not have the established management instruments, both created before the SNUC and their institutionalizations have not been updated. Thus, the analysis focuses on the APA determined by the State of São Paulo, which has a *Conselho Gestor* (CG) (Management Board) formalized by Resolution SMA 30/2004 and a *Plano de Manejo* (PM) (Management Plan) and a *Zoneamento Econômico-Ecológico* (ZEE) (Economic-Ecological Zoning) by Resolution SMA 64/2008.

Located in the Serra da Mantiqueira, in the Atlantic Forest biome, APA SFX has a sloping topography with a large number of springs and watercourses of strategic interest to planning, the main one being the Peixe River, an important contributor to the Jaguari reservoir. Jaguari, in turn, is an important water reservoir and energy producer for the Metropolitan Region of Vale do Paraíba e Litoral Norte (RMVPLN) and the Metropolitan Region of São Paulo, via the Jaguari-Atibainha transposition. Given this relevance for the Capital of São Paulo, the territory of APA SFX is included in the State Government's *Plano de Desenvolvimento e Proteção Ambiental* (Environmental Protection and Development Plan).

At the municipal scale, the APA SFX has also become the focus of public policies aimed at conserving water resources, such as Payment for Environmental Services (PES). The SJC City Hall PES pilot project was implemented in the micro-basin of *Ribeirão das Couves*, belonging to the *Rio do Peixe* basin, for it has a degraded landscape due to agricultural activities while is responsible for the district's water supply (FIORE et. al., 2020).

**Figure 1 – APA SFX location map at MRVPLN, highlighting Rio do Peixe and Jaguari reservoir in São José dos Campos-SP**



Source: Own elaboration (2020). Data obtained in IBGE (2010); SOSMA (2013); CEIVAP (2019).

The process of occupying the territory of APA SFX took place in different phases: the first goes back to the origin of the district, with the first villages with few houses, which served as a shelter for muleteers passing between Minas Gerais and São Paulo, whose activity predominant was subsistence agriculture (SOUZA, 2014). The second phase occurs with the introduction of dairy farming and greater removal of forests for the establishment of pastures (SANTOS, 2007).

From the 1980s onwards, the third phase of local occupation began, intensified in the 1990s, with the tourist activity and the opening of the first inns, expanding the regional dissemination of the place as a leisure space (ARAUJO, 2012). In the development process of tourist activity in recent years, the real estate market has been heated due to the demand for second homes (MARQUES, 2014). The APA's proximity to large

urban centers, such as the city of São Paulo, attracts these residents to purchase leisure farms for use on weekends and holidays (MARQUES, 2014).

APA SFX has been, in recent years, included in the “Project for the Recovery and Protection of Services Related to Climate and Biodiversity in the Southeastern Atlantic Forest Corridor” or just “*Conexão Mata Atlântica*”, financed by the Global Environment Facility (GEF), which started its field activities in the first half of 2017, with completion scheduled for June 2023. This project aims to strengthen the effectiveness of the APA’s management and the sustainable use of its natural resources, ensuring the Atlantic Forest’s conservation.

### **Methodology**

This investigation required mixed methods and was developed in two parts: the first from June 2016 to June 2017, with the collection and analysis of spatial biophysical variables and socioeconomic variables. The second part, held from July 2017 to December of the same year, aimed to relate the data obtained in the first part to the compliance to the SNUC rules, as well as the implications of the real estate market on the dynamics of land use and occupation.

The methodological procedure employed mixed methods for the form and approach of the research, with quantitative and qualitative techniques in the collection and analysis of spatial and social data. Through a case study, the discussion was deepened using the techniques of participant observation, application of questionnaires, and geoprocessing, information summarized in Chart 1.

Chart 1 - Methodological research procedure

<b>Purpose of APA</b>	<b>Protect biological diversity, discipline the occupation process and ensure the sustainable use of natural resources (BRASIL, 2000)</b>			
<i>Dimensions of Sustainable Development</i>	<i>Conservation</i>		<i>Socioeconomic Development</i>	
Part I: Does the APA fulfill the role of reconciling environmental conservation with socio-economic development based on the sustainable use of natural resources?	Variables	Verification technique	Variables	Verification technique
	Deforestation and Regeneration	Secondary data: land use classification (MARQUES, 2014);	Total households	Secondary data (IBGE 2000,2010; IPLAN, 2014)
	Management Plan	Georeferencing; secondary data; fieldwork	Socioeconomic data	Primary data: application of questionnaires; participant observation
	Zoning of APA SFX	Georeferencing; secondary data; fieldwork	Quality of life	Primary data: application of questionnaires, participant observation
	Opening of roads	Primary georeferencing data; fieldwork		
	Built-up areas	Primary georeferencing data; fieldwork		
Part II: Relationship Part I to SNUC and the real estate market.	Variables: SNUC compliance and real estate market influence. Techniques: Questionnaire; fieldwork, and participant observation (participation in activities promoted by the APA).			

Source: Own elaboration (2020).

For the analysis of environmental conservation, we used the results of Marques (2014), using his APA SFX land cover classification, adding here information about new road openings and building, to identify the expansion of occupation at the site, and the questionnaire, covering questions about environmental perception.

In this sense, to analyze the land subdivision, a mapping of the new buildings be-

tween 2007 (one year before the Management Plan) and 2017 (year of the research) was elaborated. This technique was applied to investigate the distribution and characteristics of occupation in the APA concerning the zoning, and also to identify possible vectors of occupation expansion and the most sensitive areas.

In the mapping of built-up areas, roads, and secondary roads, a high-resolution image of 0.60 cm was used in the composition of multispectral bands from the Quickbird 2 satellite for 2007 (SJC, 2016), being worked on in the ArcGis software. For 2017, the images available on Google Earth were used, taken from a set of images obtained by the Pleiads 1A and 1B and SPOT 6 and 7 satellites, provided free of charge, at 0.50 cm resolution, with composition multispectral, with image overlay and feature extraction performed in the QuantunGis software. The information extraction process was based on visual interpretations of the orbital images and their respective vectorizations, on a scale of 1:1,400 meters.

The captured features were superimposed on the cartographic base of the APA SFX zoning (FUNDAÇÃO FLORESTAL, 2008). Comparing the mapping of the two dates made it possible to calculate a percentage of occupation growth in these ten years using the logic: areas built in 2017 minus areas built in 2007, divided by area built in 2007, and subsequent extraction of the percentage. It is noteworthy that the identified value is an estimate, given the difficulty of visually interpreting images in an environment of high altitude and presence of clouds, providing the value as an indication of the intensity of occupation in the territory.

For the analysis of socioeconomic development, three groups of economic activities that were decisive in the historical process of occupation were identified, as indicated by the existing bibliographic reference (SANTOS, 2007; ARAÚJO, 2012; MARQUES, 2014 and SOUZA, 2014) and observed through the work field: small dairy farmers, inns and real estate agencies. Data collection was carried out through participant observation (TURRA NETO, 2004) and application of questionnaires, which made it possible to obtain information on the demographic and economic profile of the participants, institutional context, and quality of life, defined here by a set of conditions of the individual's life, based on their perception and attribution of value to their well-being.

To identify the sample number among the listed groups, different data sources were used. For milk producers, the base of information consulted was ORBE (2017), a local NGO that had a list of 14 producers in the APA, of which 10 agreed to participate. For the inns, the work of Araújo (2012) was used as a reference and the same database consulted by him at Ecoviagem UOL; of the 17 inns registered and in business in the territory of the UC, 12 inns participated. Of the 6 real estate companies operating at APA SFX, 5 agreed to participate. In total, the research involved 27 participants.

The participation of all respondents was voluntary and supported by the *Certificado de Apresentação para Apreciação Ética* (Certificate of Presentation for Ethical Appreciation) number 46505115.5.0000.5503, in which this research is incorporated. This study was also submitted to the approval of the Technical-Scientific Committee of the *Instituto Florestal*, obtaining approval through SMA Process No. 260108 – 008.781/2017.

### **Changes in land use and occupation and landscape transformations**

From 2000 onwards, it has had an increase in the use of land for leisure houses/farms occupied on weekends or occasionally. Marques (2014) discusses this phenomenon of the second home at APA SFX, showing, from the 2000 and 2010 Censuses, the higher growth of homes for occasional use than for permanent use, a fact that implies changes in both the landscape and the socio-economic relationships that are established in the territory.

For this purpose, this author presented the land use mapping for APA SFX in the years 1999 and 2013, through the process of capturing and classifying the physical features obtained through Landsat 7 Satellite images of 03/09/1999 and images of Satellite Landsat 8 of 09/01/2013, a spatial resolution of 15 meters and support of the topographic map of the municipality, with contour lines of 5 meters (MARQUES, 2014).

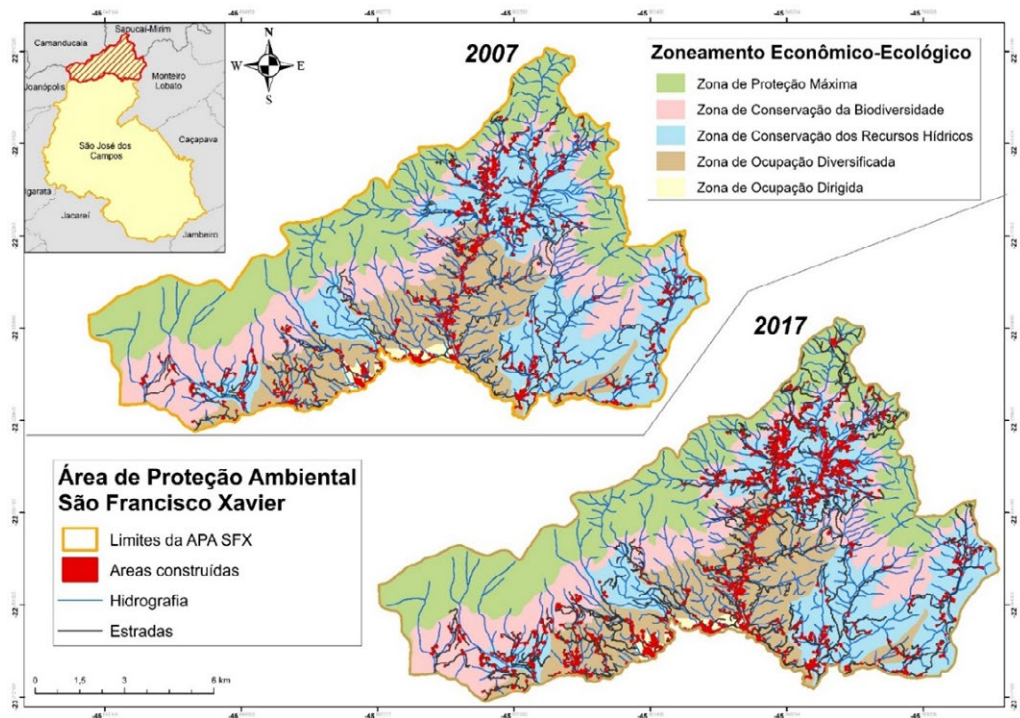
In this temporal analysis, the author related the decrease in exposed soil areas (from 7.4 km<sup>2</sup> in 1999 to 0.57 km<sup>2</sup> in 2013) with the increase of native vegetation areas in an initial stage by 7.98% and advanced stage in 10.81% from the first date to the second (MARQUES, 2014), as an indication that a revegetation process was taking place. It also points to the growth of areas undergoing natural regeneration as part of the decay process of agricultural activities and the change in land use for occupation, in particular, of second homes (MARQUES, 2014).

Another point highlighted by the author was the increase in rural settlements, with an increase of 66% between the two dates (MARQUES, 2014). Based on land subdivision data (ITESP, 2012), Marques (2014) related the increase in rural settlements and the geoenvironmental sensitivity of the land, indicating that such settlements are located in areas of greater vulnerability.

To complement the analysis, the evolution of the opening of roads and newly built areas between 2007 and 2017 was identified, as shown in Figure 2.



Figure 2 – Advancement of built-up areas and road openings in APA SFX from 2007 to 2017



Source: HENRIQUE (2018).

The maps demonstrate the advancement of roads and built-up areas, superimposed on the APA SFX Ecological Economic Zoning. The different colors represent the zones and their respective conservation objectives, as shown in the legend. From this mapping, it was possible to perform the calculation of built-up areas, as described in the methodology.

It was identified that the increase in new openings for house construction is significant: the areas built in 2007 occupied an estimated area of 193,290 m<sup>2</sup>, increasing in 2017 to 352,620 m<sup>2</sup>, which means a growth of approximately 82.43% of the built areas, in 10 years.

The Zone that suffers the greatest pressure from occupation is the Water Resources Conservation Zone (WRCZ), represented in blue on the maps in Figure 2. This zone comprises drainage areas of the hydrographic sub-basins considered important for the production of water and maintenance of the springs. The portion of the WRCZ that showed the greatest increase in occupation, located in the northern portion of the APA territory, is identified as WRCZ Santa Bárbara.

WRCZ Santa Bárbara was the same region pointed out by the participants as being the most sought after by new residents due to the panoramic view that the place offers and the abundance of watercourses. Undertaken fieldwork, it was possible to verify an

expressive amount of irregular properties of 1,000 m<sup>2</sup>, being that the rural least plot-size, established by Decree 5591/65, is 20,000 thousand m<sup>2</sup>.

The second portion of the WRCZ with greater density and expansion of occupation is called WRCZ Santa Cruz. According to real estate companies, its expansion was a reflection of the great demand for the region of Santa Bárbara and, consequently, the increase in the price of land due to its overvaluation. The Santa Cruz region also offers a privileged location in terms of landscape in the APA and has an abundance of water-courses and springs, attractive factors for the new resident.

Recent studies demonstrate that deforestation, especially in areas with steep slopes, can cause erosion and degradation of soil and water (SANTOS et. al, 2000, TAMBOSI et. al, 2015; ÁVILA et. al, 2020). Thus, the increase in the land subdivision can cause: (I) the degradation of the territory, since it causes the increase of roads and soil destabilization in areas of an accentuated slope; (II) the fragmentation and disruption of ecological corridor connectivity; (III) Greater use of water resources by human consumption, especially leisure and gardening, and among others, putting into question the quantity and quality of the local water supply, such as an important resource of this UC.

The heated real estate market reveals the constant economic valuation of the territory, as a result of the increase in tourist demand, which is reflected in the growth of activities such as the provision of services in local construction, home care, maintenance of leisure farms, and small businesses. The change in land use, the increase in subdivisions, and the overvaluation of land show that the logic of the real estate market expands as the economic activities developed previously become unsustainable. As the tourist activity of the second residence develops, it induces a decline and abandonment of less economically expressive local activities to activities of the service sector, confirming the trend pointed out by Cruz (2007).

The second zone of greatest occupation pressure identified by the mapping is the Maximum Protection Zone (MPZ), represented in the maps in Figure 2 in the green-colored areas. Analyzing the northern portion of the APA SFX, it is noted that its occupation represents an extension of the occupation of the Santa Bárbara region, being the areas with the highest altitudes in the territory. This zone is characterized by the topography of slope greater than 45°, the main headwaters of the River do Peixe contributors, native vegetation, and the natural habitat of the Muriqui.

Although the WRCZ and the MPZ have the most specific and restrictive occupation guidelines and provisions, allowing their use through a specific plan for the sustainable management of resources (SÃO PAULO, 2008), it is in these places that the vectors for the expansion of roads and built-up areas occur. The lack of governmental surveillance, the insufficient physical demarcation in the territory of the APA boundaries and its zones, as well as the lack of clarity about the UC occupation rules are factors that corroborate the discourse of ignorance of the UC's internal rules for those which are in irregularity.

The opening of new roads for housing construction has been a strong element of environmental pressure in the occupation of important local micro-basins, both in areas within restricted elevation zones and in *Áreas de Preservação Permanente* (APPs)

(permanent preservation areas), such as in the regions of Cateto, Canelar, Rio Manso, and stretches of Santa Bárbara. The function that rivers offer in the supply of domestic water, productive viability, whether from agriculture to tourism, works as an attraction for the occupation of these areas.

The Municipal Law 428/2010, referring to Zoning, already recognized two areas, the neighborhoods of Ferreiras and Remédios, as *Zona de Assentamento Informal* (Informal Settlement Zone), an irregular occupation, not characterized as being of social interest. With the formulation of the new Master Plan for the municipality (Complementary Law 612/2018), among its measures, there is the expansion of the urban area of the SFX district, including the perimeter of the neighborhood of Ferreiras, and placing the neighborhood of Remédios as a population settlement likely to be transformed into urban pockets, for land tenure regularization purposes. However, it is not foreseen for the territory to include any population settlement of urban characteristic, even if some are in a precarious situation, as a *Zona Especial de Interesse Social* (ZEIS) (Special Social Interest Zone), since the public sphere understands that that occupation is not characterized by low income.

Martins (2012) points to the appropriation of the landscape by the tourism industry and, consequently, speculation in the real estate market, as one of the main conflicts in UCs and, therefore, should be analyzed in greater depth.

Ferreira et. al (2001), in an analysis of uses and conflicts in the APA of Ilha Comprida, *Estação Ecológica* Juréia-Itatins and Alto do Ribeira State Park, presents that tourism, especially second-home tourism in Ilha Comprida, has profoundly changed cultural and work relations in the place. They state that activities carried out on the farm or at sea, as well as the social dynamism resulting from these productive practices, were replaced by activities in the provision of services, to supply the new local economy (FERREIRA et. al, 2001 ).

The APA SFX also portrays the local sociocultural mischaracterization, such as the transformation of some rural producers, who when selling their properties for second-house use, become housekeepers. Other activities resulting from the sociocultural transformation are construction, as foremen and bricklayers; tourism, as guides; local businesses, as helpers. It is important to highlight that there is a change in the profile of these families, formerly milk producers, who own their land and control the time and use of their workforce, for temporary employees.

This transformation in the APA SFX landscape is also perceived by the local actors themselves. Most respondents in the three groups pointed out that the main transformations of the landscape were the increase in land subdivision and the opening of roads, the change in land use, the valuation of land, and the increase in the number of residents. The increase in environmental conservation in the last two decades was mentioned by 50% of rural producers, around 34% of inns, and 20% of real estate companies, as a highlight of the transformation in the landscape.

All actors from the inns and real estate groups recognize this increase in human occupation at APA SFX and present a relationship to the pressure in the use of natural resources (about 42% of inns to 60% of real estate companies). Although in response to

the questionnaire, producers established less of the relationship between increased occupation and pressure on natural resources, when visiting properties, there was a recurrent speech that evidenced the decrease in the amount of water in water resources.

In short, it was observed that the current process of occupation of APA SFX is predominantly linked to tourism and second homes, transforming the landscape. If, on the one hand, tourist activity contributes to a certain extent to the revegetation of old degraded and inefficient pastures, on the other hand, it drives the intensification of land subdivision. In this sense, forest fragmentation, disruption of connectivity, and increased pressure on water resources and local infrastructure have an impact on degradation, also implying sensitive local economic and cultural changes.

### Changes in land use and occupation and socioeconomic development

As presented in the methodology, this work sought to understand the relationship between current changes in the use and occupation of APA SFX, investigating the performance of locally determinant economic activities. Table 1 below summarizes some information on the socio-economic profile of the target groups.

**Table 1 – Socioeconomic profile of the sampled groups**

Questions investigated	Milk producers (total=10)	Inns (total=12)	Real estate (total=5)
Average time of activity (years)	41	19	5
Residency in SFX (years)	45	23	18
Has complementary economic activities (yes)	8	10	3
Average monthly income declared (by minimum wage)	4	6	Not declared

Source: Own elaboration (2020).

Most dairy farmers were born in SFX and reside in the APA, on average for 45 years, which is equivalent to their average age, performing the same activity as their parents, with the property inheritance. Among the owners of inns, the average residence and time of economic activity are, respectively, 23 and 19 years. For real estate owners, the average residence in the territory is 18 years, with an average activity time of 5 years, who previously performed other activities in the area, such as commerce and agricultural activities.

As for the financial income declared in 2017, the monthly average for dairy farmers is 4 minimum wages, while for inn owners it is 6 minimum wages (for the minimum wage of R\$937.00 in 2017). Real estate companies did not declare the income. Of the total number of participants, 21 stated that they need complementary forms of income

so that they can maintain their standard of quality of life, as well as help maintain their main activity at a time of little economic return (for example, in low tourist activity, economic crisis or low price of milk). Such activities and complementary income consist of forms of investments, retirement, rental houses in the APA, civil construction, and commercial points of the SFX district.

All participants declared to face economic challenges. Milk producers highlight the low financial return of milk, which on average is sold at R\$1.15 per liter (average price reported by milk producers participating in the survey in July 2017, with the current average price being R\$2.36<sup>2</sup>), insufficient for the maintenance of the property and new investments, linked to the lack of public support, either credit or technical assistance. The inns pointed out as the main problems for their activities the precariousness of infrastructure in the APA and the difficulties in forming a work team with local labor (lack of specific training and attendance). For real estate companies, the main challenge of the activity is the low financial return, given that many properties have irregular documentation. All real estate companies declared not to negotiate irregular land, below the rural module.

Despite such perceptions, all participants said they were satisfied with living on SFX. For milk producers, satisfaction is related to the realization of their rural lifestyle, through livestock production in the territory. However, they claim that livestock has an uncertain future in the APA due to low productivity and incentives for reforestation (of Permanent Protection Areas, under the Forest Code), which makes management difficult and increases costs, gradually expelling livestock activity and, consequently, their local way of life.

For the owners of inns, satisfaction is related to being able to live in a place of environmental quality, with natural attributes in a good state of conservation, with “pure” air, an abundance of water resources, and good construction standards. The real estate companies also related the satisfaction of local life to the conservation of the environment and tranquility, as opposed to the urban reality. These two groups believe they will benefit, in terms of economic gains, from increased conservation, as tourism and real estate demand will increase.

Regarding the conservation of the Atlantic Forest, the three groups report the APA’s potential as a means of ensuring environmental conservation, positively impacting the maintenance of the quality of water resources and thus making the territory more attractive to tourists. This is also a consensus for dairy farmers, despite feeling prejudiced by the conservation rules.

Of the total number of participants, 24 indicated that the main transformation of the territory since 1990 was the increase in the land subdivision, with a consequent increase in occupation and transformation in its use. Such speech is felt and referred to in the discourse among milk producers, recognizing that, given the low profitability of

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2 - According to data from the Centro de Estudos Avançados em Economia Ampliada (CEPEA, 2020) of the Escola Superior de Agricultura Luiz de Queiroz (EZALQ) the average net price of a liter of milk for the state of São Paulo is R\$2.36 on 09/09 /2021. <https://www.cepea.esalq.usp.br/br/indicador/leite.aspx>

milk production, many families opted to sell the land and change their lifestyles.

Also for this group, such economic transformation directly affects the sociability relationships typical of rural areas. An example given is the relationship between neighbors in the collective work of mowing or harvesting, which ended with an exchange of surplus production and socializing at lunches, balls, or even religious celebrations. Such practices are changed and work becomes predominantly salaried.

To assess the influence of the creation of this *Unidade de Conservação* on the main economic activities of the territory and use of resources, the study sought to understand some issues relevant to the knowledge of the policy instruments, their function, and rules of use and occupation of APA SFX, as presented in Table 2.

**Table 2 – Answers by the different groups about APA SFX's creation and its management instruments.**

Questions investigated	Milk producers (total=10)		Inns (total=12)		Real estate (total=5)	
	Yes	No	Yes	No	Yes	No
Do you know that the territory belongs to an APA?	10	0	12	0	5	0
Do you know the role of APA São Francisco Xavier?	5	5	11	1	5	0
Do you know that the APA has a Management Plan?	4	6	7	5	5	0
Do you know that the APA has an Economic-Ecological Zoning?	4	6	5	7	3	2
Do you know that APA has a Management Board?	5	5	12	0	5	0
Have you ever participated in any activity of the Management Board?	1	9	5	7	2	3
Have you ever been a member of the Management Board?	1	9	3	9	1	4

Source: Own elaboration (2020).

It is noted that 100% of respondents recognize the fact that this territory is an APA. The group of milk producers is the one that showed the greatest lack of knowledge about its function, as well as its instruments, such as the Management Plan, the ZEE, and the Management Board, which may corroborate the low participation of this group in the Board's activities.

Regarding the role of the APA, there are differences in understanding between the groups. For the milk producer, the function of the APA is related to the protection of

the environment, which acts to restrict the development of their rural activities. As for the inns and real estate companies, the environmental protection function of the APA directs the occupation, while creating favorable conditions for the development of their economic activities.

In Table 2, it is possible to observe a lack of knowledge among the participants about the instruments of the APA. The Management Plan, when mentioned by the participants, was limited to a general definition of rules for the use of the territory. The ZEE was defined only by the inns as a set of rules with specific boundaries in the territory, according to permitted uses.

Regarding the Management Board, once again the milk producer is the one that least recognizes its role (50%), compared to inns and real estate agencies (100% both). Regarding direct participation in the Management Board or any action linked to it, until the period of this research, only 1 milk producer claimed to have participated, acting as an advisor; for 5 owners of inns, of which 3 were already advisors and, finally, 2 owners of real estate companies, of which 1 was already an advisor.

Despite this difference in the representativeness of participation between the three groups, a positive aspect of the Board's role in the co-management of the APA is the expressive participation, around 35 people per meeting, throughout the observation period of this research.

Participant observation also revealed that most people who got involved in the Management Board's activities are motivated by concern for environmental conservation. The investments made by the *Conexão Mata Atlântica* can contribute to the APA's conservation and economic effectiveness since activities that promote sustainable development are planned through certification, sustainable production chains, and payment for environmental services (SÃO PAULO, 2020).

The data presented in this section highlight that among the three groups surveyed, the milk producer is the oldest resident and perceives the implementation of the APA as inhibiting their activities and transforming their cultural practices. The inns and real estate agencies, on the other hand, believe that the implementation of the APA in the territory makes the region more promising for their activities. As for the knowledge and participation of the APA's rules and instruments for management, it is the milk producers who have less direct involvement with the co-management of the UC when compared with the other two groups surveyed.

## Conclusions

The article sought to investigate whether the *Área de Proteção Ambiental* (Environmental Protection Area), as a SNUC category, fulfills its role in reconciling environmental conservation with the sustainable use of natural resources, to foster local socioeconomic development, given the complexity and popularization of this UC category.

It is presented that, in the APA SFX, despite the increase of revegetated areas, the opening of new roads, as well as the increase in built-up areas, indicate a pressure for

occupation in the most sensitive areas, which should guarantee greater control in the uses for environmental conservation. Such pressure vectors increase the fragmentation of the natural environment and indicate an increase in the consumption of natural resources, especially water resources, in addition to hampering the land regularization process, causing sensitive economic and social changes. It is recognized that the process of the economic decay of extensive dairy farm activity has a relevant role in the revegetation of the landscape, as well as the regulation and management of the APA have a role as an important organizer of new activities, potentially degrading or conservationist, that may be installed in the territory.

As for the social aspects, there is an imbalance in the satisfaction of performance and expectations of economic activities investigated in the APA SFX. While there is a decline in livestock activity, undertaken by more traditional local families and with lower economic income, the inns and the real state companies market identify economic opportunities, resulting from the conservation of the APA.

Lack of knowledge of APA instruments, such as the Management Plan, ZEE, and Management Board, coupled with the insufficient inspection, information, and dissemination, contribute to the occurrence of unsustainable use practices. In this way, the APA rules generate results that sometimes benefit the environment, constraining the population, other times benefit the population at the expense of the environment. The function of the APA is precisely to find the best balance or trade-offs between the economic, cultural, and environmental dimensions of sustainable development in their territories.

For APA, as a category of the SNUC, to be able to achieve its objectives, it needs to face some challenges such as (I) the irregular occupation and consequent irregularity in the land tenure situation; (II) the insufficiency of adequate ways for economic growth based on the sustainable use of its resources; (III) the current tendency of traditional culture loss; (IV) the lack of knowledge on the role of the APA, as well as the objectives of its Management Plan and ZEE; (V) the imposition of a UC on populations without economic conditions to adapt to the new reality; and (VI) the little or no participation of the different social groups in the UC management. The challenges for the success of APA are many and of all dimensions. Such success cannot be achieved without articulated management between the different governmental levels and agencies, in close articulation and participation of the local community, and with a set of public policies in line with sustainable development.

Finally, it is noteworthy that the current moment of a pandemic caused by the SARS-CoV-2 coronavirus has increased real estate speculation and occupation of APA SFX. The relative isolation of the territory from large urban agglomerations has attracted, according to current perceptions of the Management Board, a greater number of people interested in housing in the territory. However, this process can contribute to the irregular subdivision of the land, since there is a greater demand for it, increasing the environmental pressure and the consumption of natural resources, such as water, in addition to intensifying tension between the new and old residents. Thus, these new social arrangements are an important issue for future research to understand the dynamics in the use



and occupation of the territory and its relationship to new socio-economic configurations and policy for territorial planning.

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## Referências

ADAMS, W.M. The dilemma of sustainability. In: Adams, W.M. *Green Development: Environment and Sustainability in a Developing World. Third Edition*. London, Routledge, p. 1–25, 2009.

ARAÚJO, R. S. P. **Contradições do Planejamento Territorial do Turismo no Brasil – O Distrito de São Francisco Xavier, São José dos Campos (SP)**. 2012. Tese (Doutorado em Geografia), Programa de Pós-Graduação em Geografia Humana do Departamento de Geografia da Faculdade de Filosofia, Letras e Ciências Humanas da Universidade de São Paulo, São Paulo. 2012.

ÁVILA, F. F. ALVALÁ, R. C. MENDES, R. M et al. A influência da variabilidade do uso / cobertura da terra e da intensidade da chuva no desencadeamento de deslizamentos de terra: um estudo de análise retroativa por meio de modelos físicos. *Nat Hazards*, 2020. Disponível em: <https://doi.org/10.1007/s11069-020-04324-x> Acesso em: 08 nov. 2020.

BRASIL. Presidência da República. Decreto nº 55.891, de 31 de março de 1965. Regulamenta o capítulo I do título I e a seção III do capítulo IV do título II da lei nº 4.504, de 30 de novembro de 1964 - Estatuto da Terra, *Diário Oficial da União*, Brasília, 08 abr. 1965. Seção 1. p. 3569. Disponível em: [http://www.planalto.gov.br/ccivil\\_03/decreto/1950-1969/d55891.htm](http://www.planalto.gov.br/ccivil_03/decreto/1950-1969/d55891.htm) . Acesso em: 07 nov. 2020.

BRASIL. Presidência da República. Decreto nº 87.561 de 13 de setembro de 1982. Dispõe sobre as medidas de recuperação e proteção ambiental da Bacia Hidrográfica do Rio Paraíba do Sul e dá outras providências. *Diário Oficial da União*, Brasília, 14 set. 1982. Seção 1. p. 17150. Disponível em: [http://www.planalto.gov.br/ccivil\\_03/Atos/decretos/1982/D87561.html](http://www.planalto.gov.br/ccivil_03/Atos/decretos/1982/D87561.html) Acesso: 20 jun. 2017.

BRASIL. Lei nº 9.985, de 18 de julho de 2000. Regulamenta o art. 225, § 1º, incisos I, II, III e VII da Constituição Federal, institui o Sistema Nacional de Unidades de Conservação da Natureza e dá outras providências. *Diário Oficial da União*, Brasília. Disponível em: [http://www.planalto.gov.br/ccivil\\_03/LEIS/L9985.htm](http://www.planalto.gov.br/ccivil_03/LEIS/L9985.htm) . Acesso: 01 mai. 2017.

BRITO, M. C. W. **Unidades de conservação: intenções e resultados**. In: Ciência Ambiental — Primeiros Mestrados. In: José Eli da Veiga (Org.). Programa de Pós-Graduação da USP. São Paulo. 1998.

COMITÊ DE INTEGRAÇÃO DA BACIA HIDROGRÁFICA DO RIO PARAÍBA DO SUL-CEIVAP. **Sistema de Informações Geográficas e Geoambientais da Bacia Hidrográfica do Rio Paraíba do Sul**. 2019. Disponível em: <http://sigaceivap.org.br/saibaMais> Acesso: 05 fev. 2020.

CRUZ, R. C. A. **Introdução à geografia do turismo**. São Paulo: Roca, 2007.

FERREIRA, I. C. et al. Conflitos sociais em áreas protegidas no Brasil: moradores, instituições e ONGs no Vale do Ribeira e Litoral Sul, SP. **Revista Ideias**. 2001.

FIORE, F. A.; BARDINI, V. S. S.; CABRAL, P. C. P. Arranjos institucionais para a implantação de programa municipal de pagamento por serviços ambientais hídricos: estudo de caso de São José dos Campos (SP). **Eng. Sanit. Ambient.** Rio de Janeiro, v. 25, n. 2, p. 303-313, Mar. 2020. Disponível em: <http://dx.doi.org/10.1590/s1413-41522020193011>. Acesso em: 08 nov. 2020.

FUNDAÇÃO FLORESTAL. **Zoneamento Econômico Ecológico da APA SFX**. 2008. Disponível em: <http://fflorestal.sp.gov.br/files/2012/01/APA%20Sao%20Francisco%20xavier.pdf> Acesso: 15 jun. 2017.

HENRIQUE, R. Área de Proteção Ambiental (APA) como instrumento de planejamento territorial e regional para o desenvolvimento sustentável: o caso da APA de São Francisco Xavier. São José dos Campos, Dissertação (Mestrado em Planejamento Urbano e Regional) - Universidade do Vale do Paraíba, 2018. Disponível em: <https://biblioteca.univap.br/dados/00003a/00003a32.pdf> Acesso: 05 fev. 2020.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. **Divisão territorial brasileira**. 2010. Disponível em: <https://www.ibge.gov.br/geociencias/organizacao-do-territorio/divisao-regional/23701-divisao-territorial-brasileira.html?=&t=o-que-e> Acesso: 05 fev. 2020.

LÉLÉ, S. M. Sustainable development: a critical review. In: **World development**. v.19, n.6, p.607-621, 1991. Disponível em: <https://www.sciencedirect.com/science/article/abs/pii/0305750X9190197P> Acesso: 15 fev. 2020.

MARTINS, A. Conflitos ambientais em unidades de conservação: dilemas da gestão territorial no Brasil. **Revista Geografía y Ciencias Sociales**. v. XVII, n. 989. Disponível em: <http://www.ub.edu/geocrit/b3w-989.htm> Acesso: 1 mai. 2017.

MARQUES, A. R. **Ordenamento e Governança Territorial: Estratégias para Proteção Ambiental na APA de São Francisco Xavier São José dos Campos SP**. 2014. 113f. Dissertação (Mestrado em Planejamento Urbano e Regional) – Universidade do Vale do Paraíba, São José dos Campos, 2014. Disponível em: <http://biblioteca.univap.br/dados/000005/000005ac.pdf> . Acesso: 15 dez. 2015.

MEDEIROS, J. **Desenvolvimento urbano e meio ambiente no Distrito de São Francisco Xavier – subsídios ao ordenamento territorial**. 2005. 146f. Dissertação (Mestrado em Planejamem-

to Urbano e Regional) – Universidade do Vale do Paraíba, São José dos Campos, 2005.

MORAES, M. B. R. **Implementação das áreas de proteção ambiental federais no Brasil: o enfoque da gestão**. 2011. 199f. Tese (Doutorado em Geografia) - Faculdade de Filosofia, Letras e Ciências Humanas, USP, São Paulo, 2011.

SODERBAUM, P. **Economics, ideological orientation and democracy for sustainable development**. Suécia: World Economics Association. 2018.

RUSCHMAN, D. M. (Coord.). **Plano de Desenvolvimento Integrado do Turismo Sustentável – São Francisco Xavier**. Ruschmann Consultores: 2002.

SACHS. I. **O tripé do desenvolvimento incluyente**. Palestra Magna. Seminário de Inclusão. Social. BNDES. 22 e 23 de setembro de 2003.

SANTOS, C. A. G; et. al. Influência do tipo da cobertura vegetal sobre a erosão no semi-árido paraibano. **Revista Brasileira de Engenharia Agrícola e Ambiental**, v.4, n.1, p.92-96, 2000.

SANTOS, R. B. **Formação histórica e transformações socioculturais no distrito de São Francisco Xavier**. 2007. 150 f. Dissertação (Mestrado em Planejamento Urbano e Regional). Universidade do Vale do Paraíba, São José dos Campos, 2007

SÃO PAULO. Lei nº 11.262, de 8 de novembro de 2002. Declaram Áreas de Proteção Ambiental o trecho da Serra da Mantiqueira e as áreas urbanas no município de São José dos Campos. **Diário Oficial**, São Paulo, 2002. Disponível em: <http://leisestaduais.com.br/sp/lei-ordinaria-n-11262-2002-sao-paulo-declaram-areas-de-protecao-ambiental-o-trecho-da-serra-da-mantiqueira-e-as-areas-urbanas-no-municipio-de-sao-jose-dos-campos> Acesso: 20 jun. 2017.

SÃO PAULO. Secretaria do Meio Ambiente do Estado de São Paulo. Resolução SMA 64, de 11 de setembro de 2008. Institui o Plano de Manejo da Área de Proteção Ambiental APA São Francisco Xavier. **Diário Oficial**, São Paulo, 11 set. 2008.

SÃO PAULO. Governo do Estado. Instituto de Terras do Estado de São Paulo “José Gomes da Silva” – ITESP. **Laudo de identificação fundiária da APA SFX**. São Paulo: ITESP, 2012.

SÃO PAULO. Infra-estrutura e meio ambiente. **Projeto Conexão Mata Atlântica**. Disponível em: <https://www.infraestruturameioambiente.sp.gov.br/conexao/> Acesso: 10 fev. 2020.

SÃO JOSÉ DOS CAMPOS. Lei nº 4212, de 24/06/1992. Declara Área de Proteção Ambiental - APA - trecho da Serra da Mantiqueira no município de São José dos Campos. **Jornal Boletim do Município**, São José dos Campos, 25 jun. 1992. Disponível em: <https://servicos2.sjc.sp.gov.br/legislacao/Leis/1992/4212.pdf> Acesso: 15 jun. 2017.

SÃO JOSÉ DOS CAMPOS. LEI COMPLEMENTAR Nº 428, DE 09/08/2010. Estabelece as normas relativas ao parcelamento, uso e ocupação do solo em São José dos Campos, e dá outras providências. **Jornal Boletim do Município**, São José dos Campos. Disponível em: [https://servicos2.sjc.sp.gov.br/media/403308/lc\\_428-10\\_com\\_anexos.pdf](https://servicos2.sjc.sp.gov.br/media/403308/lc_428-10_com_anexos.pdf) Acesso em: 07 nov. 2020.

SÃO JOSÉ DOS CAMPOS. Secretaria de Planejamento e Meio Ambiente. **Cidade viva 2014**: Banco de dados geográfico - Spring 4.33 – Tutorial. São José dos Campos: PMSJC, 2016.

SÃO JOSÉ DOS CAMPOS. Lei complementar nº 612, de 30 de novembro de 2018. Institui o Plano Diretor de Desenvolvimento Integrado do Município de São José dos Campos e dá outras providências. **Jornal Boletim do Município**, São José dos Campos, 2018. Disponível em: <http://camarasempapel.camarasjc.sp.gov.br/legislacao/norma.aspx?id=44121> Acesso em: 07 out. 2020.

SOS MATA ATLÂNTICA. **Dados sobre cobertura vegetal**. 2013. Disponível em: <https://www.sosma.org.br/> Acesso: 05 fev. 2020.

SOUZA, R. A. **São Francisco Xavier “num dedinho de proza”**. São Paulo: All Print Editora, 2014.

SOUZA, Z. R. et. al. São Francisco Xavier – SP: um distrito sustentável. In: XV Encontro Latino Americano de Iniciação Científica, 2014, São José dos Campos. **Anais...** São José dos Campos: UNIVAP, 2014.

TAMBOSI, L. R. et al. Funções eco-hidrológicas das florestas nativas e o Código Florestal. **Estudos Avançados**, São Paulo, v. 29, n. 84, p. 151-162, 2015. Disponível em: <https://doi.org/10.1590/S0103-40142015000200010>. Acesso em: 08 nov. 2020.

TURRA NETO, N. Observação participante como metodologia de pesquisa em Geografia Cultural. In: **Anais XIII Semana de Geografia: Paraná, 150 anos: Natureza e Formação Sócio-Espacial**. Departamento de Geografia da Universidade Estadual do Centro-Oeste. Guarapuava: UNICENTRO, p.81-95, 2004.

VALLEJO, L. Unidade de Conservação: Uma Discussão Teórica á Luz dos Conceitos de Território e Políticas Públicas. **GEOgraphia**, Rio de Janeiro, v.4, n.8, p.57-78, 2002.

**Raquel Henrique**

✉ [kellhenrique@gmail.com](mailto:kellhenrique@gmail.com)

ORCID: <https://orcid.org/0000-0001-5899-3816>

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**Maria Angelica Toniolo**

✉ [angelica.toniolo@univap.br](mailto:angelica.toniolo@univap.br)

ORCID: <https://orcid.org/0000-0001-7835-3285>

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# Planejamento Territorial e Desenvolvimento Sustentável: Um Estudo de Caso da APA São Francisco Xavier-SP

Raquel Henrique  
Maria Angelica Toniolo

São Paulo. Vol. 24, 2021

*Artigo Original*

**Resumo:** Este artigo trata de um estudo de caso na APA estadual São Francisco Xavier, localizada no município de São José dos Campos, e teve como objetivo avaliar a efetividade desta categoria de UC enquanto instrumento de planejamento territorial capaz de cumprir seu papel de conciliar a conservação ambiental com o desenvolvimento socioeconômico, a partir do uso sustentável dos recursos naturais. Desenvolveu-se por meio de uma abordagem de multimétodo, quali-quantitativa, utilizando-se de trabalho de campo, observação participante, questionários e geoprocessamento para levantamento e análise de dados primários e secundários. Os resultados demonstram que a APA promove a conservação, mas não está livre de ameaças e não dispõe de meios efetivos e permanentes para garantir a promoção do desenvolvimento socioeconômico a partir do uso sustentável de seus recursos naturais. O estudo sugere que o planejamento territorial seja articulado entre os níveis de governo, suas diferentes agências e com a comunidade local.

**Palavras-chave:** Área de Proteção Ambiental (APA); São Francisco Xavier (SFX); Conservação; Desenvolvimento Sustentável; Planejamento territorial.

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# Planificación territorial y desarrollo sostenible: un estudio de caso de APA São Francisco Xavier-SP

Raquel Henrique  
Maria Angelica Toniolo

São Paulo. Vol. 24, 2021

*Artículo original*

**Resumen:** Este artículo es un estudio de caso en el estado APA São Francisco Xavier, ubicado en el municipio de São José dos Campos-SP y tuvo como objetivo evaluar la efectividad de esta categoría UC como un instrumento de planificación territorial capaz de cumplir con su papel de conciliar la conservación. con el desarrollo socioeconómico, basado en el uso sostenible de los recursos naturales. Desarrolló a través de un enfoque de métodos múltiples, cualitativo y cuantitativo, utilizando trabajo de campo, observación participante, cuestionarios y geoprocuremento para encuestar y analizar datos primarios y secundarios. Los resultados demuestran que APA promueve la conservación, pero no está libre de amenazas y no tiene medios efectivos y permanentes para garantizar la promoción del desarrollo socioeconómico basado en el uso sostenible de sus recursos naturales. El estudio sugiere que la planificación territorial se articule entre los niveles de gobierno, sus diferentes agencias y la comunidad local.

**Palabras-clave:** Área de Protección Ambiental (APA); São Francisco Xavier (SFX); Conservación; Desarrollo sostenible, Planificación territorial.

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