


TRANSFORMATIONS IN THE LANDSCAPE ADJACENT TO THE CACHOEIRA DO SUL RAILWAYS: IMPACTS OF (NON) HUMAN ACTION AND URBANIZATION

TRANSFORMAÇÕES NA PAISAGEM ADJACENTE ÀS FERROVIAS DE CACHOEIRA DO SUL: IMPACTOS DA (NÃO) AÇÃO HUMANA E DA URBANIZAÇÃO

TRANSFORMACIONES EN EL PAISAJE ADYACENTE A LOS FERROCARRILES DE CACHOEIRA DO SUL: IMPACTOS DE LA ACCIÓN (NO) HUMANA Y LA URBANIZACIÓN

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ABSTRACT

This study analyzes the transformations in the landscape adjacent to the railway stations of Cachoeira do Sul, considering the impacts of human action (or lack thereof) on urbanization and on natural physical and modernization processes. The objective is to highlight the historical and heritage importance of these infrastructures and discuss viable alternatives for their reintegration into the use and urban space of the community in an appropriate way. Despite the abandonment, the rails are still used for cargo transport, highlighting the contrast between functionality and degradation. The research adopts a multidisciplinary approach, based on bibliographic survey, documentary analysis, study of satellite images and photographs made available by users on Google Maps. The results include a diagnosis of the changes in the landscape adjacent to the railroads and the proposition of strategies for tourist, cultural and sports uses and preservation of the history of Cachoeirense.

Keywords: Landscape. Railway Station. Cachoeira do Sul. Urbanization. City.

RESUMO

Este estudo analisa as transformações na paisagem adjacente às estações férreas de Cachoeira do Sul, considerando os impactos da ação humana (ou falta dela) na urbanização e nos processos naturais físicos e de modernização. O objetivo é ressaltar a importância histórica e patrimonial dessas infraestruturas e discutir alternativas viáveis para sua reintegração ao uso e espaço urbano da comunidade de maneira adequada. Apesar do abandono, os trilhos ainda são utilizados para transporte de carga, evidenciando o contraste entre funcionalidade e degradação. A pesquisa adota uma abordagem multidisciplinar, baseada em levantamento bibliográfico, análise documental, estudo de imagens de satélite e fotografias disponibilizadas por usuários no Google Maps. Os resultados incluem um diagnóstico das mudanças na paisagem adjacentes às ferrovias e a proposição de estratégias para usos turísticos, culturais e esportivos e preservação da história cachoeirense.

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Palavras-chave: Paisagem. Estação Férrea. Cachoeira do Sul. Urbanização. Cidade.

RESUMEN

Este estudio analiza las transformaciones del paisaje adyacente a las estaciones ferroviarias de Cachoeira do Sul, considerando los impactos de la acción humana (o su ausencia) en la urbanización y en los procesos físicos y de modernización naturales. El objetivo es destacar la importancia histórica y patrimonial de estas infraestructuras y discutir alternativas viables para su adecuada reintegración al espacio urbano y su uso en la comunidad. A pesar de su abandono, las vías aún se utilizan para el transporte de mercancías, lo que resalta el contraste entre funcionalidad y degradación. La investigación adopta un enfoque multidisciplinar, basado en una revisión bibliográfica, análisis documental y el estudio de imágenes satelitales y fotografías proporcionadas por los usuarios en Google Maps. Los resultados incluyen un diagnóstico de los cambios en el paisaje adyacente a las vías férreas y la propuesta de estrategias para usos turísticos, culturales y deportivos, así como para la preservación de la historia de Cachoeira do Sul.

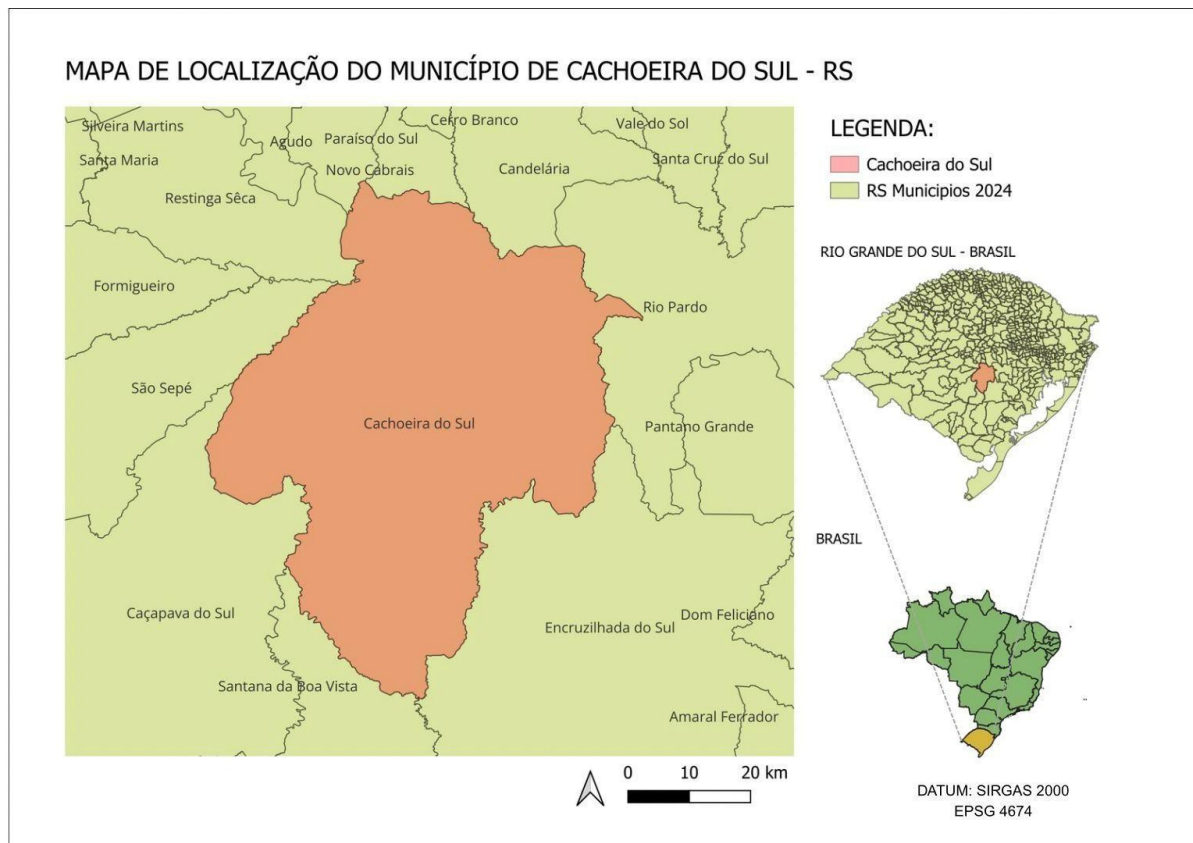
Palabras clave: Paisaje. Estación de Ferrocarril. Cachoeira do Sul. Urbanización. Ciudad.

1 INTRODUCTION

The city of Cachoeira do Sul, located in the central region of Rio Grande do Sul, as its shown in map of the municipality of Cachoeira do Sul, has its origins linked to the process of occupation of the southern interior during the colonial period. According to Ritzel, 2020 initially emerged as a crossing point of the Jacuí River, where the strategic geographical position favored the establishment of a community that, over time, developed as a result of trade routes and agricultural activities. Officially founded in 1820, Cachoeira do Sul had its trajectory marked by urban growth, the expansion of railroads and regional economic transformations. It was the fifth municipality created in Rio Grande do Sul. The proximity to the Jacuí River facilitated navigation and the flow of agricultural production, especially rice, becoming one of the economic bases of the municipality. Over the centuries, the city has consolidated itself as an important regional hub, preserving its historical and cultural relevance in the gaúcho scenario.

Figure 1

Location of Cachoeira do Sul



Source: Authors.

According to the 2020 Demographic Census of the Brazilian Institute of Geography and Statistics (IBGE), the municipality has a territorial area of 3,736.158km² and an estimated population of 81,869 people. The rural population is considered to be composed of 12,127 inhabitants, which makes up 14.5% of the total number of residents; the remainder, approximately 85.5%, is in urban areas (IBGE, 2010).

2 METHODOLOGICAL PROCEDURES

The research was conducted through an integrated approach to the landscape that contemplates different stages and areas of knowledge, such as architecture and urbanism, geography, sociology, economics and the environment. This integration allowed for a more comprehensive and detailed analysis, considering both territorial and socioeconomic aspects as well as environmental impacts and urban transformations over time.

Initially, a bibliographic and documentary research was carried out, with the review of historical and urban records referring to the railway station and the railway network of Cachoeira do Sul, in addition to geographical data made available by the IBGE. This stage also included the study of theories developed by geographers and urban planners addressed in the classroom in the architecture and urbanism course at UFSM Campus Cachoeira do Sul, in order to understand the evolution of these infrastructures and their impact on the urban development of the city. Then, a geographical analysis of the areas of interest was made, considering their territorial and socioeconomic characteristics, observing aspects such as land use and occupation, urban transformations over time and their causes and the environmental impacts resulting from these changes.

The methodology also includes the study of maps and satellite images, using tools such as Google Maps, Google Earth and QGIS. This analysis makes it possible to identify changes in land use and environmental conditions in the region, especially in areas previously occupied by railway structures, which today may have been converted into crops, industrial areas or other urban uses.

In addition, a field survey was carried out, with visits for direct observation, photographic records and analysis of the current conditions of the space. This stage will allow the identification of possible routes and activities to be developed on trails, such as routes adapted for different types of travel (bicycle, car, motorcycle or walk), opportunities for interaction with the environment (such as river bathing and ecological tours) and the

educational use of the trail, especially aimed at students who are learning about local history, promoting a didactic and immersive experience.

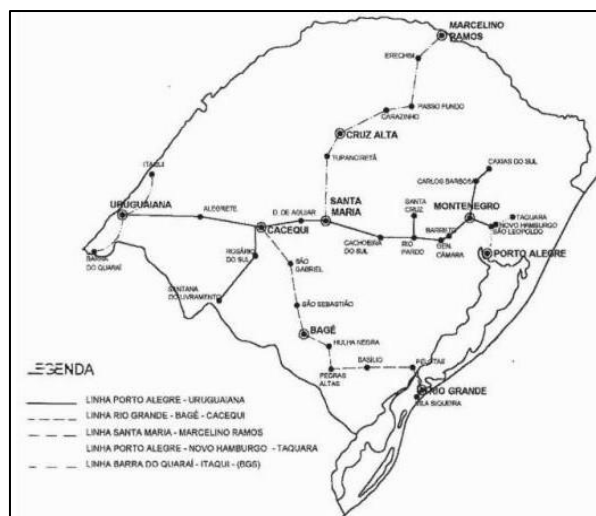
3 RESULTS

3.1 CHARACTERIZATION OF THE CACHOEIRA DO SUL RAILWAY NETWORK

With a scenario of growth and modernization, the railroads began to operate in Cachoeira do Sul on March 7, 1883, with the inauguration of the local railway station. This landmark integrated the city into the 148 km stretch of the "Porto Alegre-Uruguaiana Railroad", connecting the bank of the Taquari River to Cachoeira do Sul. The following year, on October 13, 1884, the stretch that connected Cachoeira do Sul to Santa Maria was inaugurated, and later, in 1890, the railway extension to Cacequi was completed (IPHAN, 2010, p. 2).

Figure 2

Railroad network of Rio Grande do Sul in 1910



Source: IPHAE, 2002, p.25

Figure 3

Arrival of the train at the station in 1940



Source: RAILWAY STATIONS OF BRAZIL, 2022

The arrival of the railroad boosted the economic development of the region, facilitating the transport of goods and passengers. Due to the ease of transportation and flow of production, the surroundings of the station became a space for commercial, industrial, and service enterprises, especially with the installation of rice mills (Ritzel, 2020). However, from the 1950s onwards, rail transport began to lose ground to road transport. The presence of the railway line in the city centre came to be seen as an obstacle to urban traffic, leading to the deactivation of the original station in 1973 and its demolition in 1975.

Figure 4

Train crossing Rua Júlio de Castilhos

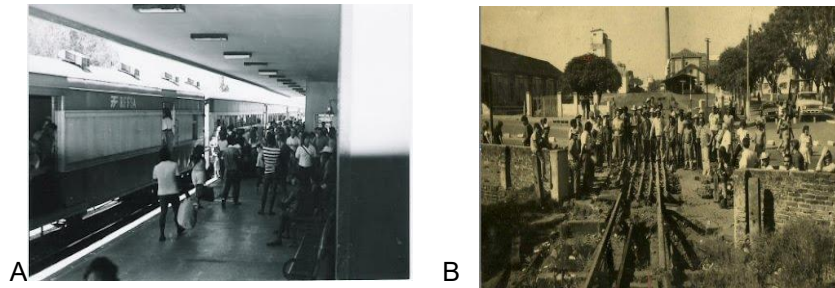


Source: RAILWAY STATIONS OF BRAZIL, 2022

A new station was built outside the center, but it was also decommissioned after about 20 years, following the decline of passenger rail transport in the country. Currently, Ferreira Station, inaugurated in 1885 as part of the Porto Alegre-Uruguai line, still resists time, although in a state of deterioration. There are initiatives aimed at its restoration and seeking to preserve this historical and cultural heritage of Cachoeira do Sul (Estações Ferroviárias do Brasil, 2022).

Figure 5

A: Second Station; 5B: "Removal of the rails from the line in Cachoeira in 1974. In the background, the station that would be demolished a year later"



Source: RAILWAY STATIONS OF BRAZIL, 2022.

Figure 6

Ferreira Station currently



Source: CACHOEIRA DO SUL CITY HALL, 2022. (Photo: Renato Thomsen)

3.2 TERRITORIAL FORMATION TO THE RURAL-URBAN IN THE VICINITY OF THE RAILROAD

The city of Cachoeira do Sul exemplifies the relationship between the rural and urban areas, as discussed by Milton Santos in his work "Brazilian Urbanization":

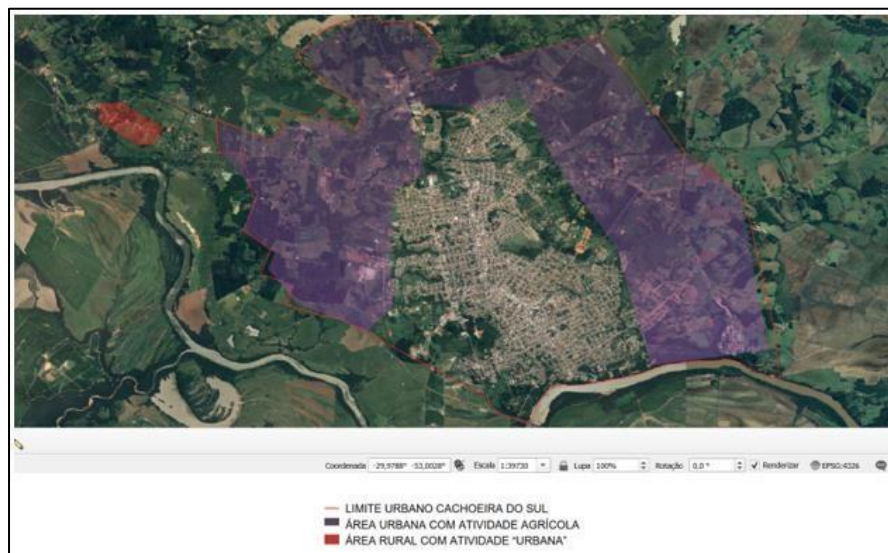
"It would simply no longer be 'rural regions' and 'cities'. Today, agricultural (and not rural) regions contain cities; urban regions contain rural activities." (SANTOS, 1998, p. 65)

The aforementioned geographer analyzes how the urbanization process, which even though it is driven by the growth of cities, does not eliminate the differences between rural and urban areas, but transforms the territory and reorganizes it. In Cachoeira do Sul, the rural dynamics, marked by the agriculture of small properties, interact with a growing urbanization, which brings with it the expansion of infrastructure, services and commerce. However, as Santos points out, urbanization does not happen in a homogeneous way,

resulting in non-uniformity between urban development and the characteristics of the rural area, where production relations and land use still maintain roots in rural practices. This relationship reflects the complexity of Brazilian urbanization, which in cities like Cachoeira do Sul, mixes modernity and rural traditions. Rural activities mixed with urban activities usually aim to meet both the supply of the urban center with rural production, and to carry out culturally urban activities in rural areas because there is more physical space.

Figure 7

Rural-urban mixing areas

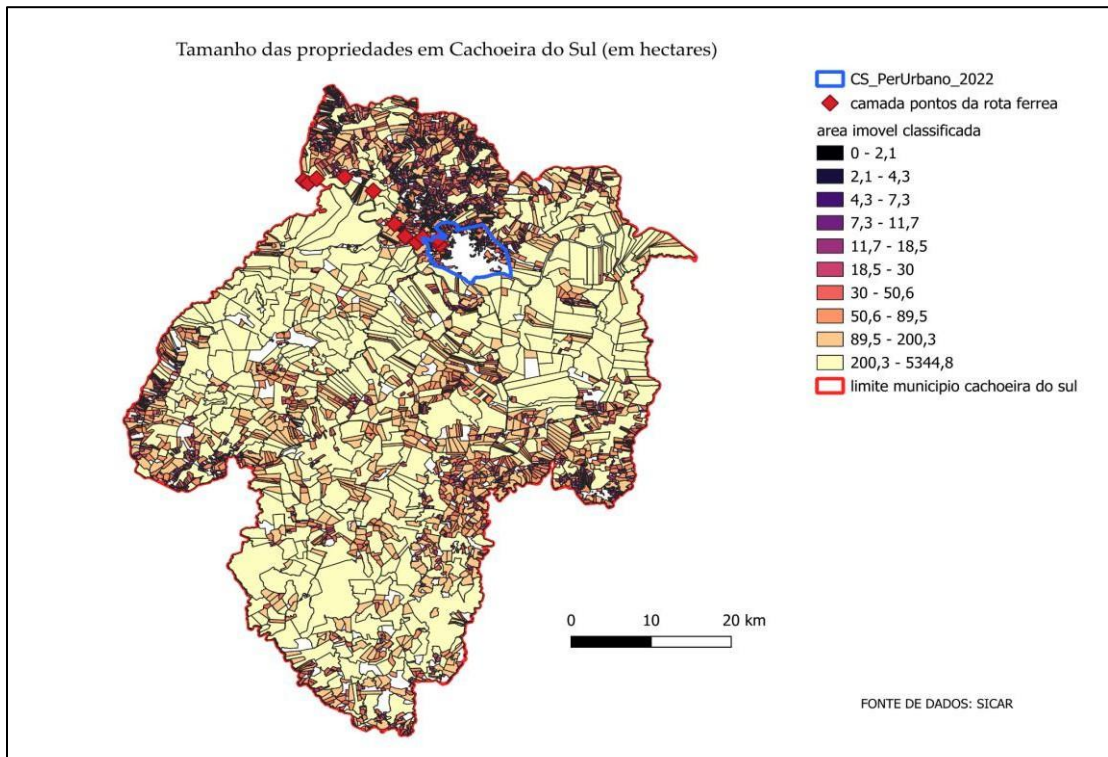


Source: AUTHORS, based on Google Earth and Fieldwork.

As shown in the following map, regarding the extension of properties in the municipality of Cachoeira do Sul, in the surroundings of the urban area (highlighted in blue on the map), there is a concentration of very small properties (in the range of 0 to 11.7 hectares, represented by the colors black, purple and violet). This spatial configuration shows a direct interaction between the urban and rural areas, where small producers coexist with the expansion of the city. The variety of sizes indicates a diverse, fragmented land structure and the complexity of land use.

Figure 8

Land Structure of Cachoeira do Sul



Source: Sicar and IBGE Archives.

According to 2017 data from the Brazilian Institute of Geography and Statistics (IBGE), Cachoeira do Sul has 2,780 rural establishments with productive activities, totaling an area of 320,464 hectares. The average of agricultural properties is 115.3 hectares, which is equivalent to about 5.7 rural modules per property. Among the cultivated crops, soybeans occupy a prominent role, totaling 99,596 hectares, which represents approximately 31% of the total area destined for production. These data show the strong presence of agricultural activity in the municipality, including in the vicinity of the urban perimeter, corroborating the coexistence between rural modernization and urban expansion discussed above.

Urbanization in Cachoeira do Sul is neither linear nor homogeneous, and the territory reflects this complexity, with small farmers remaining close to the city, while coexisting with broader market dynamics and rural modernization. This spatial configuration evidences the overlap and interaction between rurality and urbanity.

3.3 THE INFLUENCE OF THE RAILROAD ON INFRASTRUCTURE, URBAN RECONFIGURATION AND THE LANDSCAPE

In his work "*The Postmodern Condition*", David Harvey makes a critical analysis of the cultural, economic and spatial transformations that occurred at the end of the twentieth century, highlighting the transition from Fordism to flexible accumulation and its impacts on urban organization. Harvey argues that these changes not only altered productive structures, but also redefined the experiences of space and time in cities, directly influencing social configuration and dynamics (HARVEY, 1992, p. 65).

In the British context, especially in London, Harvey observes that economic restructuring led to an urban separation into distinct fragments, with central areas being revitalized to meet the demands of financial capital, while peripheries faced processes of marginalization. This phenomenon reflects the logic of flexible accumulation, which favors the mobility of capital and rapid adaptation to market changes, resulting in uneven urbanization (HARVEY, 1992, p. 72).

Comparing with the reality of Cachoeira do Sul, it is observed that the introduction of the railway network also played a crucial role in the urban and economic reorganization of the city. The railroad facilitated the flow of agricultural production, especially rice, promoting the growth of neighborhoods near the stations and changing the local social dynamics. As in London, the transport infrastructure in Cachoeira do Sul was a vector of spatial and economic transformation, shaping the city according to the demands of capital and commercial exchanges of each era.

Harvey also points out that the compression of space and time, characteristic of postmodernity, intensified the feeling of instability in social and urban relations. The speed of change and the instability of markets force cities to the challenge of constantly adapting, often as a result of sustainable and inclusive urban planning (HARVEY, 1992, p. 84). This analysis is important to understand the effects of globalization and capitalist logic on cities of different scales and contexts. David Harvey's work allows us to understand that, although in different contexts, cities share similar challenges in the face of the dynamics of capital and the demands of modernity.

Geographical space, from the perspective of Milton Santos, is understood as the totality of the earth's surface, encompassing not only the material relations, but also the immaterial ones that develop in it. This idea goes beyond the simple physical notion of space, incorporating the human actions and technical structures that continuously shape the

landscape. Space is dynamic, a social product in constant transformation, being simultaneously a stage and an agent of history (SANTOS, 2008, p. 80).

The concept of territory is worked by Santos as the junction between the ground and the population that occupies it. More than geographical limitations, the territory has an affective charge: it is the space appropriated by people, with whom they create bonds of identity and belonging. It is in the territory that the relations of work, housing, material and spiritual exchanges are structured, thus being the basis of community life (SANTOS, 2008, p. 96). The place, on the other hand, is conceived by Milton Santos as a singular instance of human experience, in which the effects of the world-totality are manifested in a specific way. Places reproduce the global world in diverse and particular ways, while being unique and universal. This duality allows the place to be both an expression of global conditions and a space of resistance and invention, where the daily experience of the subjects is materialized (SANTOS, 2008, p. 112).

For the geographer, the landscape is everything that can be perceived by the senses, and not only what is seen, but also what is felt, heard, touched, and smelled. It is the set of space, marked by volumes, colors, sounds and movements, being the visible expression of the transformations produced by human action over time. The landscape reveals the present state of space, the result of the accumulation of historical and social processes (SANTOS, 2008, p. 104). A synthesized definition of geographic space, which helps to understand the landscape as its visible expression, is in the statement that: "we can consider that geographic space is the totality of the Earth's surface" (SANTOS, 2008, p. 80), that is, the junction of territory, place, landscape and other terms discussed.

The railway line near the "Aeroclube" of Cachoeira do Sul is a good example of what Milton Santos calls landscape: a space that we feel with all our senses. Hear the loud noise of the tracks, the train whistle in the distance, smell the smell of wet weeds and rust, and even notice the ground vibrate when the train passes. Therefore, each person will perceive the same landscape in different ways. All this creates a striking scene, which mixes nature and history (SANTOS, 2008, p. 104). The landscape of the railway line near the Aeroclube is not just a static scenery: it carries with it the vestiges of a social and economic history that marked the city of Cachoeira do Sul. It is as if time had left its marks there in the form of rust, tall weeds and memory. Geographical space, in this perspective, gains thickness, it is not only what we see, but also what we feel, remember and project about the place.

The railroad landscape, therefore, is not only the sensitive expression of a lived space, it is also, as Corrêa proposes, a materialization of the social and economic structure.

"The territory is not just a continuous surface or an extension, but a structure resulting from the materialization of human actions [...] it is the material basis on which power relations are exercised and social relations are structured" (CORRÊA, 1996, p. 197).

For the author, territory is not just a geographical cut with physical and political borders, it is the result of human action, it is the space appropriated and controlled by a social group. This means that the territory is marked by relations of domination and use, and is therefore a reflection of social and economic structures. An important point in this conception is that territory is directly linked to the concept of territorial structure, to the set of material forms (cities, road networks, fields, factories) that express and condition the functioning of a specific mode of production, such as capitalism, which infers that in other economic systems, other territories would be formed. In addition, Corrêa emphasizes that the study of the territory allows us to understand the forms of spatial organization of society and the contradictions that cross it, such as center and periphery, inclusion and exclusion, wealth and poverty.

3.4 IMPACTS AND TRANSFORMATIONS ON THE LANDSCAPE

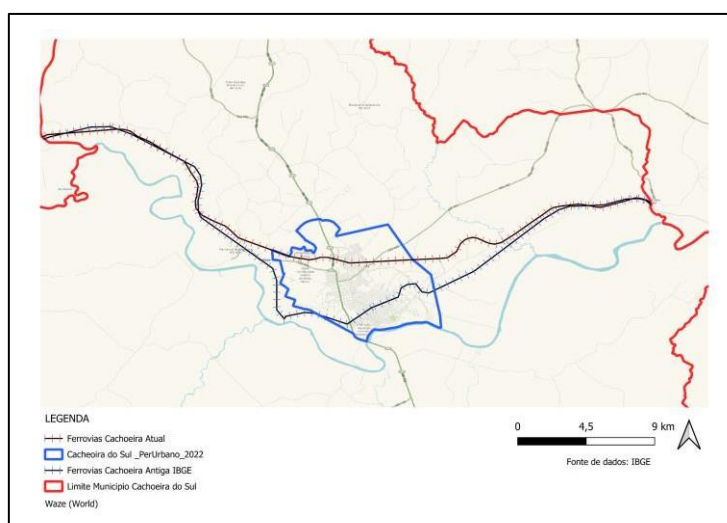
The implementation of railroads in cities such as Cachoeira do Sul was, from the beginning, a stimulus for major spatial changes, generating transformations in the organization of urban space and in its relationship with the regional territory. Roberto Lobato Corrêa explains in his work "The Urban Space" (1989, p. 25), that space is produced and reproduced by the action of various agents, such as the State, the market, real estate agents, owners of large tracts of land and society itself; And in the case of railroads, this interaction was evident from planning to the use of the areas around their tracks.

The presence of the railroad gave centrality to areas adjacent to the tracks, transforming these places into hubs for the circulation of goods and people. As Lefebvre suggests in his analyses in the work "The Production of Space" (2006, p. 370), a railroad can be seen as a structuring element of urban space. The Cachoeira do Sul railway line was a key element for the development of the city's network and, later, with the modernizations, it ended up becoming an obstacle to the continuity of this "evolution", being moved to the periphery and having its use restricted only to cargo.

The connection provided by the railways also reconfigured the space at the regional level. Transport networks shape urban hierarchies, creating relations of dependence between the larger and smaller centers (CÔRREA, 1989, p. 38). Cachoeira do Sul, by integrating itself into a larger railway network, began to play a strategic role in the flow of agricultural products, reinforcing its economic base. The production of Cachoeira do Sul flowed to several cities, with Porto Alegre being one of the main destinations for this production. Transportation was done by railroads, mainly from the construction of the Santa Maria-Rio Grande Railroad (EFSM), which facilitated the flow of agricultural products, such as tobacco, and other goods for the domestic market and exports. In addition to Porto Alegre, the cities of São Pedro do Sul and Santa Maria were also important destinations for rail flow in the region at that time (Blog História de Cachoeira do Sul, 2020).

As the city grew and its economic activities diversified, the land near the railroads became the object of disputes between social agents. Real estate agents who identified the potential for appreciation of these areas pushed for changes in land use, while local communities fought for the preservation of their homes and common spaces. This contradiction reflects what Lefebvre (2006, p. 370) describes as the clash between the "spaces of domination" and the "spaces of appropriation", used and resignified by the local population.

Figure 9: Southern waterfall railway lines over time.



Source: IBGE Database.

The old railroad directly crossed the central urban area, inserting itself into the daily life of the city and establishing a direct relationship between transport infrastructure and

urban development. Over time, this line was replaced by the current route, repositioning the tracks to peripheral and less dense areas. This change reveals a process of territorial reconfiguration in which mobility and logistics were prioritized to the detriment of social and spatial integration. This dynamic highlights what Lefebvre (2006, p. 370) calls the production of a "space of domination" (as opposed to the "space of appropriation"), in which technical and economic decisions about land use prevail over the affective bonds and daily practices of the population.

With the reduction in the importance of railroads in several cities, the areas near the tracks began to face new challenges. The deactivation of part of the railway infrastructure resulted in the landscape and functional degradation of regions that were previously central and significant. In Cachoeira do Sul, the railroad not only shaped the physical structure of the city, but also influenced its social fabric, generating dynamics of development, inequality and transformation that are still part of the local reality today. Many of these spaces, now underutilized, have become the target of revitalization projects that, as pointed out by Corrêa (1989, p. 67), often serve the interests of dominant economic groups, excluding low-income populations.

Given this scenario, the proposal arises to resignify these historical spaces in an inclusive way, through the creation of a trail that runs through relevant historical points of the city. The aim is to make it accessible to students in the process of learning about local history, athletes and cycling and running enthusiasts, as well as all those who appreciate history and tourism and wish to explore this cultural heritage. To enrich the experience of visitors, the trail can have informative signs and strategic signage along the route. These elements will aim to identify the historical sites and provide information about their relevance to the city, allowing users to better understand the context and importance of each location. The signs may include explanatory texts, historical images and even "QR codes" that direct to more in-depth digital content, such as videos, testimonies and historical documents.

In addition, the implementation of standardized signage will ensure accessibility and safety, indicating distances, directions, and levels of difficulty for cyclists and runners. To facilitate the orientation of visitors, trail maps can be made available at strategic points and on digital platforms, such as creating a route on the free platform "My Maps". With this structure, it seeks not only to preserve the local memory, but also to stimulate cultural and sports tourism, encouraging the community and visitors to reconnect with the history of Cachoeira do Sul.

3.5 ANALYSIS OF THE LANDSCAPES ADJACENT TO THE CACHOEIRENSES TRAILS

Figure 10

Vila Jacuí Railway Bridge



Source: Google Earth Pro

When comparing the 2004 and 2023 images of the Vila Jacuí Railway Bridge, changes in the landscape and in the territorial organization of the surroundings are observed. In 2004, the area near the Jacuí River presents a predominance of relatively homogeneous agricultural fields and a more sparse marginal vegetation. In 2023, there is a considerable densification of the vegetation cover, especially around the bridge, indicating revegetation or a process of natural regeneration in areas previously intended for agriculture or exposed. The surrounding agriculture seems to have reorganized itself as well: there is an intensification of the subdivision and diversification of land use in the most recent images, especially on the banks farthest from the river. This indicates that new social and economic agents have appropriated the territory, redirecting their function to meet the new demands of the agricultural market.

Figure 11

Bridge of the General Pass of Jacuí



Source: Google Earth Pro

Between 2004 and 2023, there was an intensification of agricultural use on the banks of the Jacuí River. The mosaic of fields, which already existed in 2004, appears in 2023 with even more well-defined areas, especially in the southeastern portions of the bridge. There are also changes in the border vegetation: what was previously a more sparse and discontinuous forest, is now denser, delimiting the river more clearly. Despite the abandonment of the bridge, the agricultural territorial structure remains and even expands. There is continuity in the productive use of the soil, but change in the circulation system, as Corrêa points out, the territorial structure is dynamic, and that the loss of importance of certain elements (such as the bridge) can be compensated by the intensification of other uses of space (such as mechanized agriculture).

Figure 12

Pertille Railway Station



Source: Google Earth Pro and Google maps

Between 2007 and 2023, and even more visibly until 2025, there is an intense process of naturalization and degradation of the railway landscape. In 2007, the station was still identifiable within a relatively organized rural use area, with agricultural fields and few buildings. In 2023 and 2025, we see denser and more disorderly vegetation invading the area of the tracks and the station itself. According to Milton Santos (2008), the landscape expresses the "current state" of the geographical space, the result of the overlapping of human actions over time. Thus, the current landscape of the station is the visible materialization of the loss of economic function of the railway space, the lack of maintenance and the transformation of old productive spaces into marginalized areas.

The station's 2021 and 2025 images show the physical deterioration of the building: graffiti, degradation of the walls and roof, and invasion of vegetation. The train lines are covered by bushes. Despite its abandonment, Pertille Station also becomes a space of memory: the physical remains (the building, the tracks) are material testimonies of the importance that this territory had in another era. According to Milton Santos, the places keep

a memory of the previous totalities of the world. Thus, even degraded, the station still communicates meanings, stories and experiences of a time when rail transport structured the territory.

Figure 13

Pertile Station



Figure 14

Transformation of the landscape with silviculture around the railroad



In 2008, open fields and rural areas predominated, with little presence of water bodies and limited infrastructure, while in 2024 the creation of large flooded areas, expansion of industrial facilities and increase in vegetation cover are observed, indicating significant human interventions. In terms of land infrastructure, in 2013 the region had a simple concrete bridge over a densely vegetated valley, portraying a still very natural environment.

In 2024, the railroad appears as an element of historical continuity, maintaining its operation in the midst of corridors of more closed vegetation, which suggests a growing balance between economic development and environmental preservation. Thus, the region has evolved from a predominantly rural setting to a multi-use space, with strong interaction between nature and infrastructure.

Figure 15

Agricultural expansion near the Botucaraí River



Source: Google Earth Pro

Figures 16

Railway bridge over the Botucaraí River



Source: Google Maps

In 2003 and 2008, satellite imagery shows a predominantly rural area, with dense vegetation following the course of the river and large areas of agricultural fields all around. The presence of the railroad crossing the river through a metallic structure. In 2022, the terrestrial view reveals a landscape that is still well preserved, with the river voluminous and bordered by riparian forests, while the railway bridge remains an important link over the watercourse. However, in 2024, the situation changes dramatically: the volume of the river decreases significantly, exposing large dry areas and completely altering the visual environment around the railway. This transformation indicates climate impacts and/or human actions.

Between 2022 and 2024, the Botucaraí River presented a strong contrast between periods of flood and drought, reflecting the increasing instability of water regimes. This phenomenon is the result of global warming, which intensifies extreme rainfall events and prolongs periods of drought, in addition to being influenced by climatic phenomena such as El Niño and La Niña, which alter the distribution of rainfall in South America (Marengo et al., 2016). Environmental degradation, such as the deforestation of river banks, also contributes

to aggravating these oscillations, reducing the natural capacity of ecosystems to regulate the water cycle (Nobre, 2014).

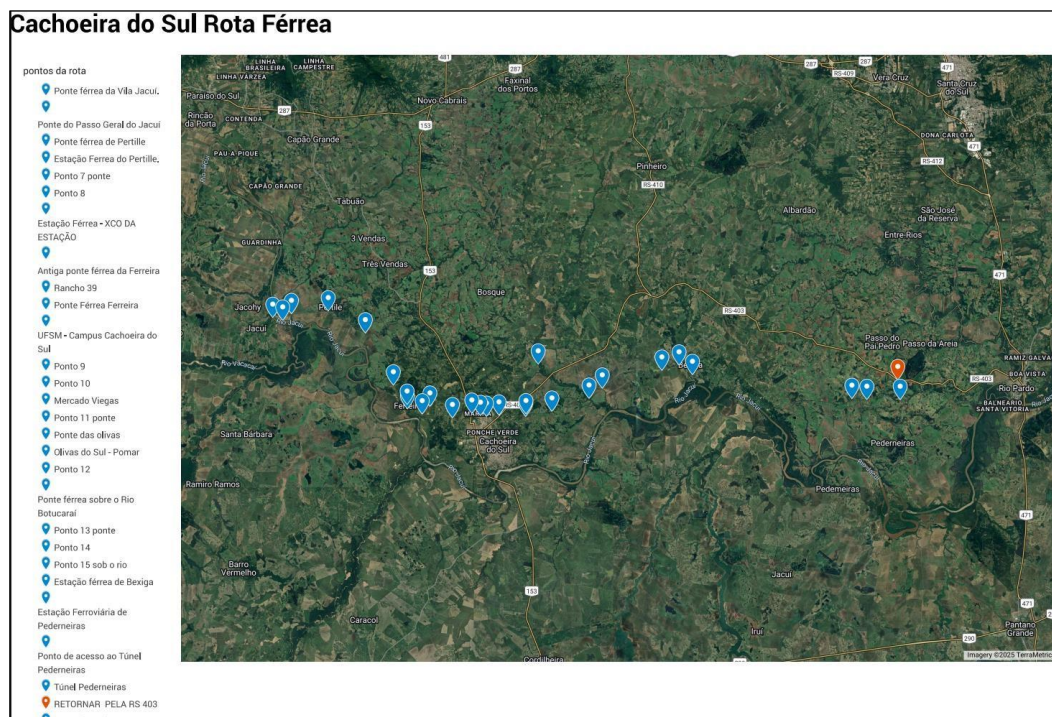
3.6 ACTIONS TO RESIGNIFY SPACES OCCUPIED BY THE RAILROAD

Based on this diagnosis, a preliminary proposal was prepared for the creation of the tourist route "Railway Line: Revisiting History Trail", which seeks to rescue historical memory and value underused spaces through a multifunctional route. The proposal includes the installation of informative signs at strategic points, providing the public with historical data, images and interactive content (such as QR Codes and quizzes), thus integrating didactic, heritage and environmental aspects.

In addition, the route of the trail seeks to contemplate routes accessible to different user profiles, including students, cyclists, runners and visitors, promoting the collective appropriation of spaces and encouraging inclusive practices of use of the territory. In this way, the study contributes to the broadening of the debate on the forms of reconversion of disused railway infrastructures and reinforces the importance of urban memory as an instrument of planning and citizenship.

Figure 17

Section of the Cachoeira do Sul railway route



Source: Created in "My Maps"

The Ferreira Railway Station faced decades of abandonment and degradation, until measures were taken. In 2016, the "Movement for the Restoration of Ferreira Station" was formed, composed of volunteers and local entities committed to the preservation of historical heritage. One of the first actions was to surround the building to prevent access by vandals and prevent additional damage; In 2017, the 3rd Combat Engineering Battalion began preparations for the restoration of the station, including the preservation of original construction techniques, such as the wooden roof shears; In 2018, volunteers from the Ponte de Pedra Group met with the commander of the 3rd BECmb to discuss the progress of the works and future partnerships in the restoration; In 2022, students from the Architecture and Urbanism course at UFSM Campus Cachoeira do Sul presented several proposals for the restoration and requalification of the station and its surroundings, suggesting new uses for the space; As of December 2022, restoration initiatives were underway, with continued engagement from the community, academic institutions, and the military. The station remains the focus of efforts for its preservation and revitalization, aiming to integrate it back into the cultural and social life of Cachoeira do Sul (Blog Ponte de Pedra, 2022).

According to information released by the Municipal Department of Tourism, Sports and Leisure of Cachoeira do Sul in 2021, SMTel organized two sporting events: the Ecotrilha Unimed and the XCO of the Cycle Station Bikes. The Unimed Ecotrilha took place offering participants the opportunity to explore ecological trails and promote the practice of outdoor activities. The XCO of Estação Ciclo Bikes, an Olympic cross-country cycling competition, challenging cyclists on more technical courses. The final results and photos of these events have not been publicly found. These initiatives sought to encourage the practice of sports and contact with nature in the region and at the same time an empowerment of these landscapes.

Figure 18

Railway Station - XCO DA ESTAÇÃO, 2019



Source: Google Maps

In 2019, we see two important scenes: in the image on the left, the old railway station, in ruins, expressing an advanced state of deterioration and physical abandonment, with parts of the roof collapsed and structure visibly compromised; on the right, the same area being reappropriated for a cycling sporting event (XCO da Estação), promoted by the City Hall. The partial reactivation of the station, even in ruins, shows new ways of appropriating the territory. Although the original use (rail transport) was abandoned, the area was temporarily reinserted into social life through the sporting event.

4 FINAL CONSIDERATIONS

The integrated analysis of documentary and geographic data allowed the formulation of an in-depth diagnosis about the transformations in the landscape and in the spatial dynamics related to the Cachoeira do Sul railroad. The progressive deactivation of the railroad network resulted in significant impacts on both the urban and rural fabrics, manifesting itself through processes of degradation, informal reuse, and occasional attempts to redefine the spaces previously occupied by the railroad.

Among the main findings, the identification of areas in an advanced state of abandonment stands out, in which railway elements, such as tracks, stations and bridges, are in physical degradation, marked by graffiti, vegetation occupation and lack of maintenance. Such evidence points to the loss of the socioeconomic function of the railroad, reinforcing the need for public policies aimed at the requalification of these spaces. At the same time, incipient initiatives for the reappropriation of the territory were observed, such as sporting events (such as the XCO of the Station) and civil movements for the preservation of the railway heritage, which indicates a latent potential for the valorization of these spaces through cultural tourism, heritage education and community leisure.

This study values the heritage and the possibility of requalification of historically significant urban spaces for Cachoeira do Sul. Although the railroad has lost its prominence with the modernization of transport systems, the reuse of its route as a tourist trail represents an opportunity to reconnect past and present, promoting urban, cultural, tourist, and health benefits. The initiative also encourages physical activity practices, such as walking, cycling and running, contributing to the quality of life of the population, while strengthening the community's bond with public spaces and local history.

The research confirmed that the railway space of Cachoeira do Sul has undergone intense transformations over time, impacting its landscape and urban configuration. The diagnosis made it possible to understand the different dynamics that emerged from the disuse of the railroad, including disorderly growth, environmental degradation and the lack of integration of this territory with the rest of the city.

Given this scenario, the proposal to create a tourist trail represents a viable way to revitalize this area in a sustainable and accessible way. By connecting railway history with leisure and tourism practices, the project seeks to strengthen local identity and provide new forms of appropriation of space by the population.

For the implementation of the trail, future steps include the deepening of studies on the necessary infrastructure, the search for institutional and community partnerships, and the preparation of a technical and economic feasibility plan. In the long term, it is expected that this initiative will contribute to the preservation of the railway memory of Cachoeira do Sul, promoting its recognition as a fundamental part of the city's cultural and territorial heritage.

To make the proposal of the tourist trail viable, it is possible to mobilize resources through programs to encourage culture, tourism and heritage. At the federal level, the "National Program for Cultural Support" (Pronac) stands out, through the Culture Incentive Law (Rouanet Law), which allows fundraising via tax waiver. In the tourism sector, the MTur (Ministry of Tourism) offers lines of financing through the "Tourism Regionalization Program" and FUNGETUR (General Tourism Fund), aimed at projects that promote sustainable tourism structuring and development.

In addition, it is possible to seek support through state public notices, such as those promoted by the Department of Culture of Rio Grande do Sul, and partnerships with educational institutions and local companies. Organizations such as SEBRAE can also be strategic partners, especially in the promotion of community-based tourism and cultural

entrepreneurship. The articulation with the public and private sectors, combined with community engagement, is a promising way to transform the proposal into a concrete action to value the railway memory and territorial development.

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