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PROPOSAL FOR ENVIRONMENTAL AND LANDSCAPE ADAPTATION: THE CASE OF TRÊS LAGOAS/MS[1]

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I dedicate this work to my family, friends and teachers who believed, helped and supported me so that I was able to overcome the difficulties I have faced so far.

"Form follows movement and human needs."

Jan Gehl

Abstract: This article is a review of my course completion work, presented at the Faculty of Architecture and Urbanism, a project for urban and landscape adaptation and the promotion of the integration of the lagoons located in the city of Três Lagoas, in the interior of Mato Grosso do Sul. During the development of the municipality, it was considered a "gateway city" and no priority was given to urban growth around the lagoons. In this study, using a methodology that seeks to characterize the landscape of the area, to understand the growth of neighbourhoods in the vicinity of these areas and their uses, through behavioural mapping, we intend to analyse the site in order to promote appropriate ways to integrate spaces, take advantage of the fauna and flora and make better use of the smaller, hitherto underused lagoons. In addition to studying a possible reintegration of the urban fabric, the project aims to preserve as much as possible of the natural appearance and current living spaces, generate local interest in getting to know the smaller lagoons and enjoy the landscape.
Keywords: FITNESS ENVIRONMENTAL; LANDSCAPE; URBANISM;

INTRODUCTION

At the beginning of the 20th century, the city of Três Lagoas (MS) began to attract attention due to its location in the Alto Paraná region - halfway between Bauru (SP) and Campo Grande (MS) - and would become a "gateway" city due to the strategic passage of the Noroeste do Brasil Railway Company (CEFNOB) through the territory of Mato Grosso do Sul, which was adapted to be the rail and road terminal. The city became a gateway, connecting the capitals of São Paulo and Campo Grande, via the highway and railroad, and also the Upper Paraná, via the Paraná and Sucuriú rivers and the use of the Jupiá hydroelectric dam.

With the growth of the highways, passenger rail transportation was also shut down, with only freight transportation (ROSA, 2020). In this context, taking into account the obvious problem of Três Lagoas, which developed rapidly on top of its natural environment, without providing adequate growth to insert the 3 lagoons (observed in the city, more specifically in the lagoons region - a characteristic landscape on the left banks of the Paraná River, on the bangs of the state of Mato Grosso do Sul), as well as the abandonment of the smaller lagoons, sparked an interest in developing this research project, which aims to review the history of the city, which grew by prioritizing the passage through the city, and to carry out the urban adaptation of the three lagoons.

Therefore, this project proposes an analysis of the activities in the "three lagoons", with a view to proper urban planning, landscaping and integration of the city's spaces; emphasizing the potential use of spaces, using contact with residents in the analysis of the built environment, looking for good use the needs of the occupants and their ages, adapting the environment to the uses, potentials and needs of the population.

Based on the results of the inadequacies of the courts, vegetation, paths and their possible recommendations with regard to the level of user satisfaction, a proposal will be made for environmental adaptation that takes into account the protection of the existing fauna and flora and encourages biodiversity, in order to eliminate the environmental irregularities and inadequacies.

Finally, the final considerations will be presented with a view to better understanding the relationship between user-perceived value and good use of the landscape, thus contributing to the improvement of future projects.

MATERIALS AND METHODS

In order to answer the research problem guiding this project to promote the integration of the lagoons with environmental and landscape adaptation in the city of Três Lagoas, located in the state of Mato Grosso do Sul, a methodology was first outlined by means of a literature review, which sought to analyze the history of the city and the objects of study, selecting the universe of tools to be applied: technical visits, photography, articles, recommendations and related case studies. It is also intended to carry out field research with a qualitative approach to analyze the improvements for the municipality and the region resulting from the integration of the lagoons, their environmental and landscape suitability and their importance in the lives of their users. Qualitative research was also chosen because:

> It is said that qualitative research is exploratory in nature, as it encourages the interviewee to think and express themselves freely on the subject in question. In qualitative research, the data, instead of being tabulated in order to present a precise result, is portrayed through reports, taking into account aspects considered relevant, such as the opinions and comments of the public interviewed. (DUARTE, [2021])

Considering the suggestions of Del Rio (1990):

> We can then conclude by suggesting some themes for the behavioral investigation of space for Urban Design. These investigations can be instrumentalized through systematized observation, photographs (sequential or not) or films, interviews, questionnaires, mapping and diagrams of use, study of customs, among others (DEL RIO, 1990).

After acquiring the data, analyzing the technical procedures, analyzing the articles produced and mapping the behavior of the users in the use of the fauna and flora, interpretations and photographs will be taken to suggest a better use of the urban space between the lagoons that enhances the natural exuberance and promotes suitable paths for integrating the spaces between them, as well as for to assist with the buildings already constructed, urban equipment and landscaping and the possible proposals for the problem presented.

Data for the research was obtained from the archives of the Municipal Department of Economic Development, Science and Technology, the Department of Tourism, the Department of Administration, the Department of Services, Assets and Information Technology. We also obtained files from the Três Lagoas Real Estate Registry, from the 1st Real Estate Registry Office of Três Lagoas, from the Honório de Souza Carneiro Historical Documentation Center (NDH) of the Federal University Mato Grosso do Sul (UFMS), Três Lagoas campus.

Throughout this search for photographic, theoretical and documentary material, a line of research was drawn up, looking for urbanistic foundations for the analysis that would contribute to the development of the research project and, in the future, to a proposal for the environmental, landscape and integration of the lagoons.

THEORETICAL BACKGROUND

Três Lagoas was founded on June 15, 1915 and "is considered the third most populous municipality in the state" according to data from the local government (2021). According to the Brazilian Institute of Geography and Statistics (IBGE 2020), Três Lagoas is located in the state of Mato Grosso do Sul and, in its last census, carried out in 2011, it had one hundred and one thousand, seven hundred and ninety-one people. In 2020, the popula-

tion was estimated at one hundred and twenty-three thousand, two hundred and eighty--one people, an increase of 17% in nine years.

In a broader context, Três Lagoas is known as the City of Waters by the population, but it is also defined as a gateway city, as it is a passage between São Paulo and Campo Grande, leading into the state of Mato Grosso do Sul and stands out for being officially considered the Pulp Capital of the World (MATO GROSSO DO SUL, 2013).

The municipality has three lagoons that give the city its name, called the largest lagoon, the middle lagoon, or second lagoon, and the smallest lagoon. The largest lagoon is considered to be the city's postcard and its importance influences the behavior of its inhabitants - a fact that has been observed since its beginnings, as can be seen in the words of Rosa (2020) when he states that Três Lagoas "is a railway city, however its project carries an innovative element which is the free area of the lagoon where a park was 'designed' (emphasis added)."

Rosa (2020) also states that:

> Unlike the Urban Project of 1911, the diagonal avenues, the squares, the park next to the lagoon, the landscaping and the project disappear here for the location of the main public buildings, making the composition more simplified and less balanced. However, one can see the insistence on trying to maintain at least one of the secondary squares previously formed by the conjunction of two blocks added to the width of the avenue that flowed into said square. Contiguous to the railroad esplanade, in front of Praça da Capela de Santo Antônio, Praça da Bandeira would now be formed, which would not be joined to the first, with the space of Avenida João Pessoa between them. In other words, they were infrequently two separate squares... (ROSA, 2020, p. 189)

In this sense, Del Rio (1990, p. 100) stresses "the importance of behavioral studies for Urban Design because, without users, public space is of little meaning and no importance".

Carvalho and Braga (2003) discuss the concept of "renaturalization" in order to minimize urban impacts on nature and improve the relationship between men and nature:

> "We are trying to think about the long-term impact of the transformation of nature. The search is on for urbanization with the least impact - minimal deconstruction, or even construction that is less "denaturalizing" - and recently the concept of "renaturalization" has permeated various attempts to achieve a better coexistence between men and nature in cities." (CARVALHO E BRAGA, 2003, p.5)

The process of renaturalization is seen by Carvalho and Braga (2003) as a task of great scope, as it requires specialists from various areas to carry out:

> "Substantiating each renaturalization measure or guideline is a task great scope, mainly due to its transdisciplinary nature, which would require the participation of several specialists. As a contribution to this work, therefore, we chose the issue of watercourse management in the urban environment, which suffers greatly from the impact of waterproofing and its traditional and increasingly unsustainable approach, i.e. sectoral and technicist urban drainage, dissociated from the totality of urban space production processes." (CARVALHO E BRAGA, 2003, p.8)

Article 2 of Law No. 12.378 (2010) provides for the activities and attributions of architects and urban planners:

> Art. 2ºThe activities and attributions of the architect and urban planner consist :
>
> Sole paragraph. The activities referred to in this article apply to the following fields of activity in the sector:
>
> I - of Architecture and Urbanism, design and execution of projects;
>
> II - of Interior Architecture, conception and execution of interior design projects;

III - of Landscape Architecture, conception and execution of projects for outdoor spaces, free and open, private or public, such as parks and squares, considered in isolation or in systems, within various scales, including territorial;

It is understood, therefore, that the architect and urban planner can collaborate both with regard to the behavior for urban design advocated by Del Rio (1990), and with regard to the process of renaturalization, exposed by Carvalho and Braga (2003), which we intend to carry out in this project.

RESULTS AND DISCUSSIONS

RELATED STUDIES

In the design reference, studies of architectural projects similar to the one we intend to develop in this work are carried out, with the aim of making analyses and reflections that lead to an understanding of the project and that collaborate in the definition of design guidelines.

Related case studies, summarized in TABLE 1 below, were used as references for the environmental and landscaping adaptation project in the lagoon area of the municipality of Três Lagoas:

CHARACTERIZATION OF THE OBJECT OF STUDY

Location of Três Lagoas

The municipality of Três Lagoas is located in the Bolsão region of the state of Mato Grosso do Sul, 325 km from the capital. Its boundaries are: to the north with the municipalities of Selvíria and Inocência, to the south with the municipality of Brasilândia, to the east with the municipality of Castilho (SP) and to the west with the municipality of Água Clara.

Figure 1 - Location of the Municipality of Três Lagoas.

Source: *Prepared by the author. (Extracted from Google Maps).*

The city has a privileged geo-economic location (FIGURE 1), at the junction of road, rail and river networks, offering access to the Midwest, South and Southeast regions.

The timeline of Três Lagoas

As Rosa (2020) reports, "The indigenous descendants of the first inhabitants of these lands can be found today in villages in Mato Grosso do Sul and São Paulo. They are the Guaranis, the Kayapó, the Kaigang, the Ofayé, around 4,000 years before our time."

Around 1828, Joaquim Francisco Lopes began exploring the region with an expedition made up of 11 people, organized in Monte Alto, where the brothers José Garcia Leal and Januário Garcia Leal were, setting up camp on the edge of the larger lagoon.

In the 1920s and 1930s: in 1910 the railroad passed through Três Lagoas and in 1911 there was an increase in construction of houses around the railway line - today removed from the city center and used only for freight transport. The beginning of settlement and conquest of the territory is highlighted as early as 1929, with the entry of landowners, farming and the start of commerce (ROSA, 2020).

Três Lagoas has a hydroelectric plant that has contributed greatly to its development since the 70s:

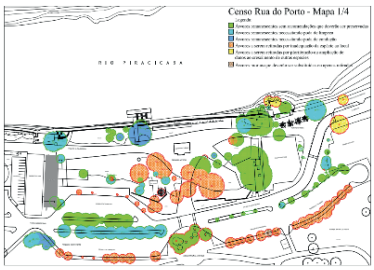
Where	Project	Proposal	Image
Piracicaba, Brazil.	The Beira-Rio Project has a vegetation management plan for its area of intervention within the urban perimeter, aimed at promoting environmental suitability.	Forest restoration and landscaping of the Rua do Porto redevelopment area, contextualization vegetation, forest diversity and environmental restoration.	
HAERBIN, China	The Rainwater Fountain Park, designed by Turenscape, envisages "green sponge" system in a wetland town, to create a multifunctional space and enhance the landscape.	Taking advantage of the local ecosystem, collecting rainwater, preserving urban integration and the environment.	
Belo Horizonte, Brazil.	The result of the competition for the redevelopment of Avenida Bernardo Monteiro in Belo Horizonte, it proposes a redevelopment of the historical and landscape complex.	Revitalization Plan for the Historical and Landscape Complex, a historical and cultural reference and the public use of the site, generating the need to relocate the craft, flower, food and antiques markets that used to operate there, looking for the best kind of vegetation for the site.	

Table 1.a List of related case studies.

Source: Prepared by the author

The Engenheiro Sousa Dias Hydroelectric Power Plant (Jupiá) was completed in 1974 and at the time was the largest hydroelectric power plant in Brazil. Today, it is considered the third largest hydroelectric plant in Brazil. Due to its strategic position and proximity to the source of electricity, Três Lagoas was considered a national security area during the military dictatorship (TRÊS LAGOAS, [2021]).

According to Bittencourt (2015), the city was organized and designed by engineer Oscar Guimarães, who was concerned with organizing the city while respecting the limits of the railway, using French inspirations such as boulevards and wide avenues, dividing the lanes in both directions, taking into account the landscaping.

The people of Tres-Lagoense

The last Demographic Census carried out in 2010 by the IBGE showed the city with a resident population of 101,791, with a distribution that can be read in TABLE 2.

Resident population	**people**
Urban resident population	**97,069 people**
Rural resident population	**4.722 people**
Men	**50.523**
Women	**51.268**

Table 2. Population data according to IBGE census.

Source: IBGE (2010). Prepared by the author

According to the data, the majority of the population lives in the urban area. In the same census, the population density was 9.966 inhabitants/km². The proportion between men and women living in the municipality is almost 50% each, with slightly more women.

From 2010 to 2020, there was a population growth of around 20%, from 101,791 in 2010 (IBGE, 2010) to 121,388 in 2019 (IBGE, 2019) and in 2020, it has a population of more than 1.5 million estimated at 123,281 (IBGE, 2020).

Municipality's economy

According to the IBGE, Três Lagoas has a GDP per capita of R$ 96,639, calculated in 2018, with a human development index (HDI) of 0.711.

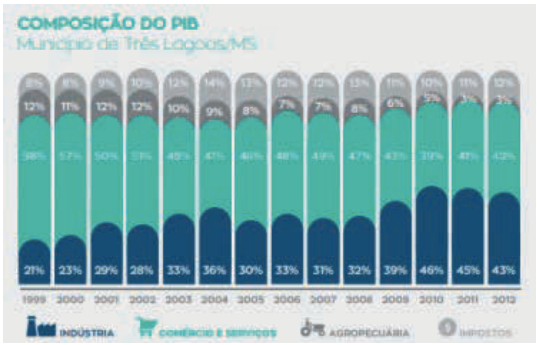


Figure 2. Composition of GDP

Source: Semade/MS and IBGE

Until 2006, 1.2% of the municipality's territory was dedicated to agriculture, mainly temporary crops, and 75.6% of the area was pastureland, which housed 617,368 head of cattle (IBGE 2013).

The sector that most boosted the economy was industry, as shown in the latest survey carried out in 2012 (FIGURE 2).

The wide range of jobs in the municipality has attracted people from all over the country, resulting in a rich cultural mix; currently, according to IBGE estimates (2021), the city has around 125,137 inhabitants.

URBAN ENVIRONMENT ANALYSIS

Urban planning instruments

Urban morphology, known as the science of behavior, shows the design urban planning is about understanding environmental impacts and influences on the environment, based on the study of local culture and the use of spaces. The urban laws in Brazil and the urban, environmental and municipal instruments used are summarized in TABLE 3 below.

In this way, the construction of the concepts of local development and public policies is a wide-ranging process and an ongoing debate as a new way of promoting development, contributing to improving the quality of life of communities, with the capacity to meet their most immediate needs, and to increase external exchange through joint community actions (ALCADE, 2007).

> On the other hand, the policies, plans, projects and programs that characterize their implementation are examined here in the light of institutional structures and what has already been implemented in Brazil in terms of legislation and professional practice. It is therefore worth noting that the new Brazilian Constitution (1988) devotes two chapters to urban and environmental policies for the first time. This is a new stage for Urban Design in Brazil. And the biggest challenge is linked to the basic concepts that inform our Constitution, such as citizenship, community participation, the social meaning of property and many others (DEL RIO, 1990).

By analyzing the laws of the city of Três Lagoas, compiled in TABLE 2, and especially the guidelines proposed in the latest master plan (2006), we can see an urban development policy that includes sustainability, qualification of public spaces and urban landscape.

LAW	DEFINITION	CREATION
Land division	Division of the land structure, plots, roads, blocks, public areas and green spaces in the urban environment.	Law No. 6.766, of 19 December December 1979
Zoning law	Use and way of laying out plots, subdivisions, occupancy rate, utilization coefficient, setbacks and classification of uses.	LAW No. 2083/2006, Master Plan for the Municipality of Três Lagoas, based on the City Statute of July 10, 2001.
Building code	It establishes rules for the building, minimum area per function, number of users, health and safety conditions.	LAW NO. 698, OF 14.05.1985.
Environment, natural resources and sanitation.	The Green Areas System is created, which is made up of all the areas protected by environmental legislation, especially parks, squares, APPs, public places, cycle paths and open spaces.	Law no. 3211/2016.
Infrastructure	Public-administrative services such as: works, water, sewage, drainage, energy, transportation, paving, health facilities, education, social assistance, public safety, zoning and social welfare.	Law 2672/2012.

Table 3. Analysis of urban laws applied in the municipality.
Source: Prepared by the author.

Climate situation

The area studied is located in an area dominated by equatorial and tropical air masses.

The Ecological-Economic Zoning apud Pinho (2018) explains that,

> According to the Köppen climate classification, ..., the climate is of the aW type (rainy tropical). The main characteristics of this type of climate are the concrete presence of two distinct periods: a rainy season comprising the months from mid-September to the end of April, when 90% of the rainfall is concentrated, and a dry period with the remaining 10% of the rainfall in the months between the end of April and the beginning of September (ZEEE/MS, 2009).

Altimetric conditions

According to the classification parameters proposed by Oliveira and Brito (1998) apud Pinho (2018) and the Institute of Technological Research (IBIDEM apud Pinho, 2018), as it has a gradient of less than 5.0%, it has:

Evaluated stretch	Dissected hill
Average gradient	Less than 2.0
Relief	Flat. Its shape can be considered a ramp (gradient of less than 5.0 %)
Urbanization of public roads [2010]	10,8 %

Table 4. Altimetric conditions.
Source: IBIDEM, apud Pinho, 2018. Prepared by the author

Três Lagoas is characterized as a flat city, (FIGURE 3) but by studying the topography, it is possible to get to know the terrain better, providing the basis for the project.

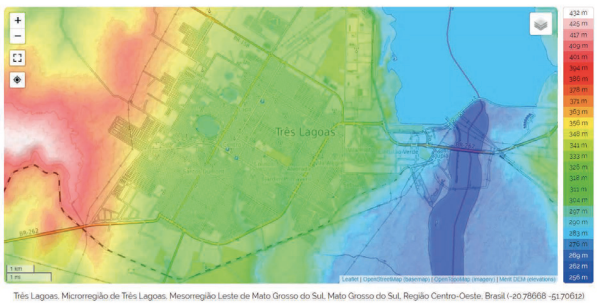


Figure 3 - Topographical map of the urban area of the city of Três Lagoas/MS.
Source: Free topographic maps

Getting to know the environment (field trip)

On May 10, 2021, the third lagoon was hiked at around 9 a.m., the second at around 9:30 a.m. and the first lagoon between 10 and 11 a.m. As can be seen from FIGURE 4 and TABLE 4, the lagoon complex has diverse environmental conditions. As can be seen from FIGURE 4 and TABLE 4, the lagoon complex presents a diverse set of environmental conditions, with the smallest lagoon in a predominantly rural area, despite being part of the urban fabric.

POINT	GEOGRAPHICAL COORDINATES	DESCRIPTION	SIGHTSEEING IN THE FIELD
P1	**Latitude**	Lagoa Menor: privately owned area Surroundings overlaps occupation urban and rural characteristics.	
	20º 45'54" S		
	Longitude		
	51º 42'33" W		
P2	**Latitude**	Second Lagoon: The natural resource receives infrastructure intervention to regulate water flow. Urbanization is present in the surroundings "giving the back" to the natural resource.	
	20° 46' ,874" S		
	Longitude		
	51° 42' 42,221" O		
P3	**Latitude**	Lagoa Maior: Environmentally sensitive area with urbanized surroundings and consequent waterproofing of the soil. Occurrence of flooding in the water complex.	
	20° 47' 9" S		
	Longitude		
	51° 43' 0,937" O		
	20° 48' 58,118" S		
	Longitude		
	51° 42' 5,378" O		

Table 4. Field visitation points.

Source: Prepared by the author

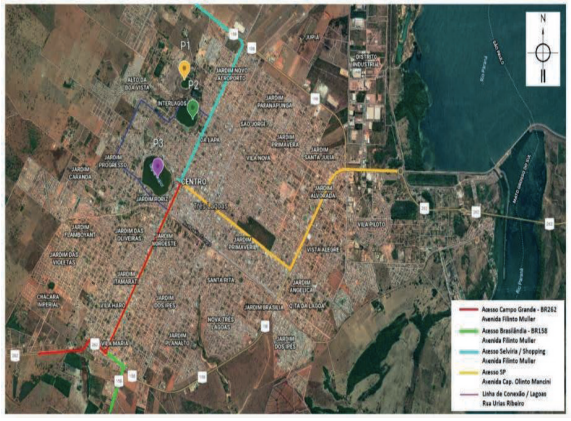


Figure 4 - Location map and access routes

Source: Prepared by the author

Based on the location map, the points of analysis were identified and individualized, as shown in TABLE 4.

While passing by the smaller lagoon, point 1 (FIGURE 5), it was observed that are no signs, there are no set paths, there is sewage, there is also a dry part, there are irregular constructions along the edge of the lagoon, there are native animals such as the tuiuiú, teal and bushy plants growing around it and it is dry.

Figure 5. P1-Lagoa menor in the city of Três Lagoas/MS.

Source: personal archive

The second lagoon is very close to urbanization, since its surroundings are occupied by predominantly residential buildings, but which have their backs to the water resource.

In the second lagoon, visitation point 2 (FIGURE 6), the same problems were observed as in the smaller lagoon, and there is still rubble and a division made with an embankment for the passage of people and vehicles.

Figure 6. P2-Debris observed in the second lagoon in the city of Três Lagoas/MS.

Source: personal archive

The largest lagoon has a structure of urbanization that characterizes it as an urban park inserted into the urban fabric with frequent and diverse use by the population. At visitation point 3, the largest lagoon: there were discrepancies between the other lagoons in terms of land use and urbanization. There were well--organized paths, signposting, parking, access mobility and urban facilities, a multi-sports court, mini shopping mall, bars, restaurants, hotels, city monuments, library, etc kiosks and planned buildings.

Figure 7. Lagoa Maior - green area

Source: Photos May 2021 (personal archive)

Figure 8. Lagoa Maior - structure

Source: Photos May 2021 (personal archive)

The larger lagoon, shown in FIGURES 7 and 8, covers around 418,000 m² and is no more than 3 meters deep. It has a flat topography and the predominant soil is gravel. It has jogging tracks, with mileage signs, free spaces where cultural events take place and physical activity is practiced during less hot weather. Users can rent electric scooters with trackers, feed the local animals, have picnics, etc.

The biodiversity that is most present includes geese, teals, capybaras and caimans. There is also planned afforestation with cerrado and exotic trees, such as: aroeira, buriti, copaíba, jacarandas, ipês, peroba, palms, sucupira and flamboyants; an aquatic plant garden with aguapés, heliconia, buriti, thalia and nymphaea; shrubs such as azalea, dracenas, bromeliads and ixora etc.

The larger lagoon also has planned circulation, urban furniture themed on animals from the cerrado, investment in maintenance, planned use of spaces, infrastructure and lighting (FIGURE 9).

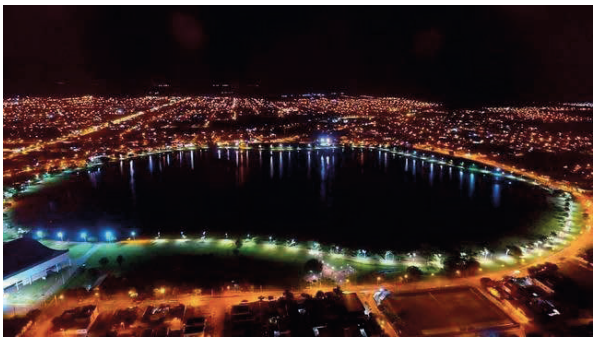


Figure 9. Aerial night photo of Lagoa Maior in the city of Três Lagoas, in 2019.

Source: Nosso MS newspaper

With regard to the residents living around the lagoons, it can be seen that:

> The oldest residents of the shores of Lagoa do Meio have a symbolic link with the lake environment, which is economically representative and provides their livelihood. The proximity between the residents and the lagoon is not a short distance, but one that is charged with affection, passion, pride and heritage.

INTERVENTION

This environmental and landscape adaptation project for the 3 lagoons in the municipality of Três Lagoas includes studies related to:

- Historical survey of the lagoon area;
- Current survey of the same area;
- Proposing use programs that take into account the preservation of local culture, memory and history;
- Remodeling spaces with integrative views, through paths, landscaping and buildings.

This project aims to propose adjustments to the lagoons, assessing urban growth, the use of space and the development of integration between them: an analysis made of the paths, use and underuse of the other lagoons and urban facilities.

Architectural Party

Integration of the lagoons based on urban mobility, paths linking the three lagoons by means of vehicles, pedestrians and bicycles, providing accessibility, communication and connection between the spaces.

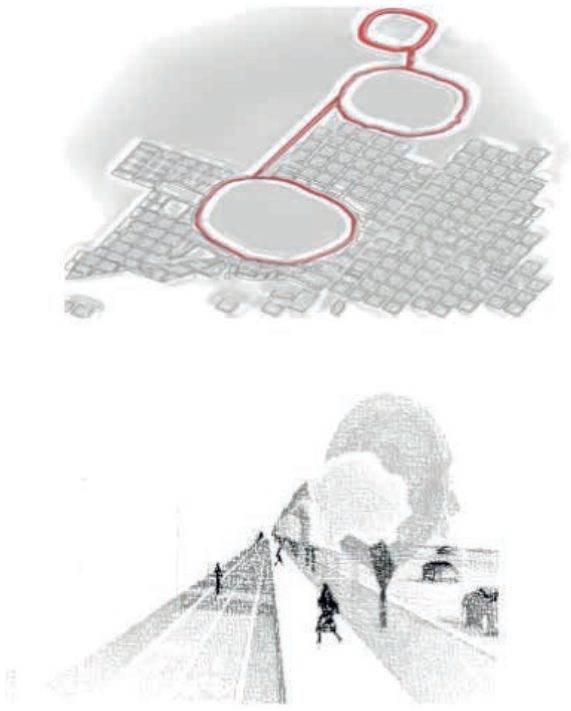


Figure 10. Architectural Design - Integration and Mobility.

Source: Prepared by the author

The integration of the lagoons (FIGURE 10) is based on urban mobility, the paths that connect the 3 lagoons by means of vehicles, pedestrians and bicycles, providing accessibility, communication and connection between spaces.

The primary objective of this party is for residents, tourists and people passing through the city to get to know and engage with the lagoons' surroundings in a way that highlights the values of community, sustainability and biodiversity in an accessible way.

It is therefore hoped that such implementation will improve the quality of life of the population, regional commerce and tourism and provide better income for the owners of the surrounding establishments, as well as enabling local thermal and ecological improvements.

Zoning

The zoning aims to establish the delimitation of the areas of influence in the lagoon complex, particularizing each area according to its ecological characteristics and sustainable use. They mainly cover non-urbanized areas close to the lagoons, while the controlled urbanization zone is projected over some non-built-up areas and others that have already been built up (FIGURE 11).

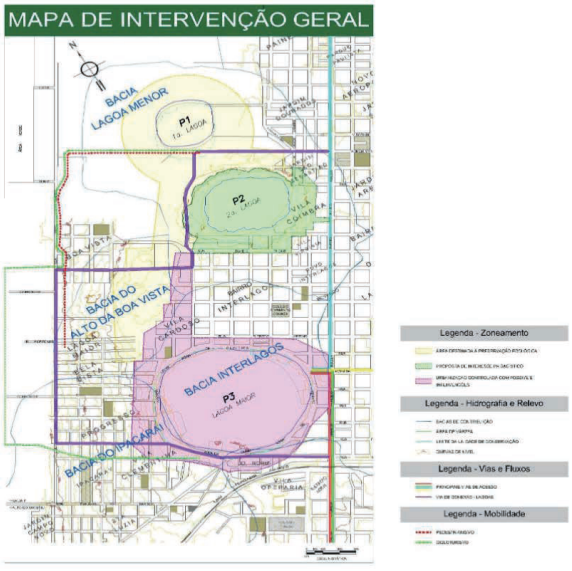


Figure 11. Zoning and Flow Map.

Source: Prepared by the author

Urban mobility, i.e. paths linking the three lagoons by vehicles, pedestrians and bicycles, providing accessibility, communication and connection between the spaces, should take place through the flow paths and routes that will receive indicative signs in the streets around the lagoons.

The existing urbanization will be treated to highlight the location of points of interest in the landscape and help the population and visitors to move the area where the lagoon complex is located.

TABLE 5 shows the main guidelines for landscaping according to the zoning established for the lagoons.

Landscape intervention proposals

The aim is for the project to motivate the use of public spaces, to reduce environmental pollution, to generate income for local businesses, to improve environmental safety and, finally, to improve the affective relationship between users and the physical environment of the lagoons.

The landscaping of zones 1 and 2 complements the intervention within the concepts set out in the project. In this way, the project is intended to motivate the use of public spaces, a partnership between the public and private sectors in the smaller lagoon, a reduction in the depredation of the environment, the possibility of generating income for local businesses, environmental safety and, finally, a contribution to improving the affective relationship between users and the physical environment of the lagoons.

FIGURE 12 shows the general layout of the environments that are to be installed in the areas.

ZONE	POINT	LANDSCAPING GUIDELINES
Ecological preservation	**P1**	Restoring native vegetation
		Adequate infrastructure with electricity and drinking water points
		Space for walking, training and playing with animals
		Stimuli for ecological ventures
Sustainable use	**P2**	Suitable landscaping
		Seats suitable for different functions
		Lighting and paths for pedestrians, cyclists and motor vehicles
		Toilets adapted for people with special needs
		Housekeeping, toilets and administration
		Semi-covered multi-purpose space for workshops, fairs, exhibitions, street theater, etc.
		Space for games and physical activities
		Playground
Controlled urbanization	**P3**	Urban planning recommendations for restricting vertical occupation, controlling density and urban infrastructure
		Maintenance of areas for the active and passive leisure of the population

Table 5. Proposals for environmental landscaping intervention.
Source: Prepared by the author

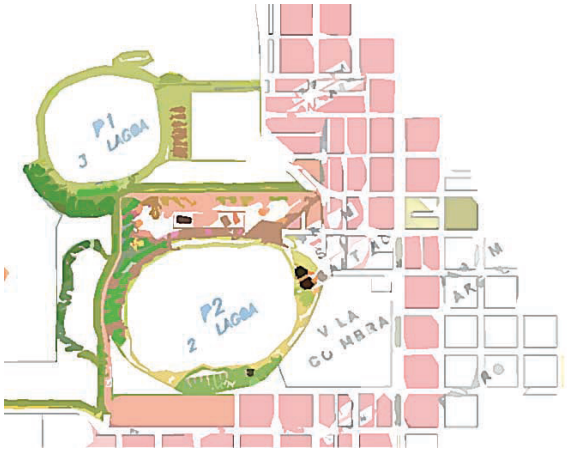


Figure 12. Implementation of zones 1 and 2 (Intervention).
Source: Prepared by the author

The revitalization of the space will be carried out through a post-occupational evaluation of the lagoons. This approach refers to the use of a series of methods that aim to diagnose positive and negative factors of the environment in the course of use, which makes it important for gauging whether the needs of users are being met. Although such an evaluation takes into account the needs, history and integration of the spaces in a coherent and sensible way, this approach allows for the breaking down of a hitherto influential pattern that public spaces have to be modest and their buildings of poor quality.

This proposal envisages the use of adapted species of flora, with different the park is made up of permeable paths with multifunctional spaces that can be used for fairs, concerts and sports activities for all ages.

This adaptation proposal seeks to consider practical options and the use of local materials, without neglecting aesthetic beauty and the promotion of appropriate and environmentally friendly native species. It is also hoped to help with climate control, water storage through drainage and sustainable adaptation.

FINAL CONSIDERATIONS

In this way, we can proceed with a well-founded proposal, appropriate to the environmental, social, theoretical, political and community environment, aimed at improving quality of life, integrating spaces and paths, planning and distributing investments related to the lagoons as a whole, and the search for "renaturalization", a balance between the environment, biodiversity, human beings and urbanization.

It is also relevant as a contribution to future work aimed at continuing to study the urban environment with a view to making proposals to improve the quality of life in cities.

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