

**Effects of a disordered urbanization: “the cities with their backs to the river”  
in the Cuiabá River Valley Metropolitan Region - RMVRC/MT**

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## ABSTRACT

The growing and disorderly Brazilian urbanization caused a series of impacts on the environment, among them the rivers pollution and the irregular banks occupations, being a characteristic phenomenon of the Cuiabá River Valley Metropolitan Region, where “the cities turned their backs to the river” developing without considering the different potentials of the existing watercourses in its territory. With this approach, this article aimed to understand this dynamic, considering that this river is responsible for the water supply of both cities, and a Pantanal Mato-Grossense affluent, making it important to identify the contradictory relationships between socio-environmental issues and the application and urban legislation supervision, by mapping PPAs, carried out in order to verify the degradation of the Cuiabá River and urban water streams in the Cuiabá-Várzea Grande conurbation. The applied methodology, based on bibliographical, documentary, and empirical research, involved studies about the theme and the region history, analyzes the legislation, maps, satellite images, thematic maps preparation from the studied areas (multiple cases) and on-site visits generating photographic records for analysis the socio-environmental impacts arising from irregular occupations verified in the protection strips (PPAs). The results demonstrated the importance of continuing new research, as well as being able to subsidize decision-making processes, formulation of urban and environmental legislation, public policies aimed at socio-environmental protection of remaining areas, which are relevant for improving the quality of life and the region environment.

**KEYWORDS:** Watercourses. Permanent preservation areas. Irregular occupations.

## 1 INTRODUCTION

The Urban rivers are striking elements of urbanity, Mumford (1998, p. 84) defines them as “the first efficient means of mass transport”, the waterway. For the author, this was what also gave rise to the “growth of cities in river valleys; and the cities emergence is contemporary with the improvements in navigation”, that is, it was from the rivers that the cities beginning took place and to this natural resource the preservation of its margins is due.

In the urban areas, the urbanization increasing comes among other factors, occupying more and more permanent preservation areas, which contributes to the soil waterproofing, reducing water infiltration and increasing the quantity and intensity of surface rainwater runoff, in addition increasing watercourses flooding. That is, as urban occupation advances over permanent preservation areas, it interferes with the hydrological cycle, which can regulate the volume of water received by rainfall, causing urban flooding.

These areas protection, guarantees the PPAs maintenance and conservation, and the environmental balance, avoiding the margins silting up, that frequently occurs due to the riparian forest destruction. The importance of its preservation contributes to the improvement of the water quality destined to supply the cities, in addition to improving the climatic conditions that are difficult to dissipate, such as the heat islands common in the region, which has great environmental relevance, since it is inserted in three Brazilian biomes, the Amazon, the Pantanal and the Cerrado.

The Cuiabá and Várzea Grande/MT are part of the Cuiabá River Valley Metropolitan Region - RMVRC/MT, which comprises the cities of Acorizal, Chapada dos Guimarães, Cuiabá, Nossa Senhora do Livramento, Santo Antônio de Leverger and Várzea Grande (PDDI, 2018). Excepting Chapada dos Guimarães, all other are bathed by the Cuiabá River waters, belonging so to the Paraguay Hydrographic Basin, whose source is located in the Rosário Oeste city.

The Cuiabá River had fundamental importance in the city's urban formation, contradictorily the municipal sanitation plans of the Cuiabá and Várzea Grande cities, recognize its relevance for the public supply of drinking water, as well as for the local and regional ecosystem.

From this context, the discussion arises around the process of environmental degradation of the Cuiabá River banks, whose urban growth process did not value the diverse potentialities of its landscapes – consolidating them as cities with their backs to the river. Contributing to this discussion, Mello (2005, p. 57), points out that with “the complexity of the modes of production and the growth of the urban population, many cities around the world have gradually turned their backs on their waterways.”

Like many Brazilian cities built on the banks of the rivers – particularly in this region, irregular occupations and the lack of effective basic sanitation are factors that endanger and impact biodiversity by promoting dispersed urbanization along the Cuiabá River PPAs and its affluents.

To highlight these weaknesses, a series of thematic maps were prepared, approaching emblematic irregular occupations cases in the PPAs strips of the right and left bank of the Cuiabá River, showing the inappropriate use and the socio-environmental situation of the region. This mapping demonstrated that irregular occupations in environmentally fragile territories in the study area were characterized as commercial, institutional, and residential, and are marked by the presence of several deficiencies and inadequacies where there is a lack of infrastructure, public transport system and urban equipment, part of the population that inhabits these areas have houses built in a precarious way.

However, when analyzing this incidence of irregular occupations on the banks of the Cuiabá River, it was noticed that Cuiabá River PPAs occupations alone are still not so expressive to degrade its waters and its aquatic fauna quality, which is so important for locals. riverside communities, for the population that is supplied by its waters and for the biomes in which it is inserted.

With the purpose of seeking a deeper understanding about the causes of pollution and the river degradation (including the aquatic fauna mortality), an attempt was made to carry out an analysis of its sub-basins. Considering that these could be the reasons for their denial or landscapes non-recognition.

The methodology used to analyze the sub-basins was based on organizing some categories similarly in each mapped urban water stream, such as defining its sources, demarcating the PPAs in line with the Forestry Code Law nº 12.651/2012, vegetation presence, verifying the basic sanitation services offer along the stream. For example, identifying or not the release of clandestine sewage in its course.

## **2 OBJETIVES**

This research aimed to study the dynamics and socio-environmental impacts arising from irregular urban occupations that occurred along the Cuiabá River Permanent Preservation Areas (APPs) and its sub-basin along the Cuiabá-Várzea Grande conurbation.

## **3 ANALYSIS METHODS**

The research, whose object was studying the Permanent Urban Preservation Areas at the Cuiabá-MT metropolitan region, was based on bibliographical, documental, and empirical research, the maps elaboration, photographic surveys and reading the pertinent urban

environmental legislation, which were fundamental to overlapping and analysis the data and information found.

When considering the studied area, it was decided to map the irregular occupations, classifying the current conditions of the PPAs, giving the research a Quali quantitative or mixed focus (CRESWELL, 2007), as it involves the quantity and quality of these interferences, where it understands It is clear that the PPAs occupied in the region are a small part of an emblematic and recurrent problem of the cities, in particular, those that grew in a disorderly way around rivers.

Therefore, adopting a holistic approach to the development of this research shows to be adequate, understanding that irregular occupations do not occur separately, they are not isolated cases, but rather, they occur in an integrated way (CAPRA, 1996, p. 16).

Thus, for this study, two territorial clippings were determined - Cuiabá and Várzea Grande, when considering the multiple study cases, to permit comparisons, analyzes under a dialectical-critical perspective, whose the phenomena investigation, tried identifying influences between the population, their social relationships contexts and the space that they occupy.

For that, it was necessary to organize it in three phases, the first, exploratory, aimed to carry out an expanded investigation about the subject, approaching the main concepts involved in the research from bibliographical survey, documental in specialized sites, periodicals of bigger national and international academic relevance, as well as in recent research, with the aim of building a theoretical basis for further case study.

In the second phase, the empirical one, the case study and the RMVRC data collection was carried out, based on a holistic view, that is, a spatial cut in which the occupations that occurred in PPAs were analyzed, observing together the numerous factors that interfere with their context. In this phase, the investigations were carried out based on information available from official bodies, satellite images analysis, thematic maps preparation of the studied areas (multiple cases), and on-site visits that generated photographic records, which were used to analysis the socio-environmental impacts arising from irregular occupations, mapped by satellite images through Google Earth and (GIS) QGIS software.

Subsequently, a quantitative survey was performed, in which cartographic bases of the Geographic Information System - GIS were used, made available in Shapefile format extracted from IBGE and treated in the QGIS 3.16 software, allowing the edition and the elaboration of thematic maps necessary for the study development.

The third phase, consisted of analyzing and interpreting the data observed in the spatial area, that is, analyzing the theoretical and empirical questions, in which the discussions were carried out, considering the main characteristics of the occupations mapped in the PPAs under study.

When considering the adopted spatial cut extension - 27 kilometers (km), it was necessary to divide it into 18 (eighteen) sections, permitting the use of a comprehensible scale to better demonstrate the anthropic actions incident in the PPAs.

With the purpose to distinguish the occupation types, different colors, textures, polygons, lines, and points were used on the maps to demarcate all the collected information. Such procedures made it possible to identify, in addition to the distinct types of occupations, the PPA areas land situation, with real estate registration (green dots), land without real estate registration (red dots).

On the maps, residential occupations were demarcated in white polygons, commercial occupations in orange polygons, textures with yellow dots - areas without riparian forest, gray diagonal lines - paved areas within the Cuiabá River PPAs.

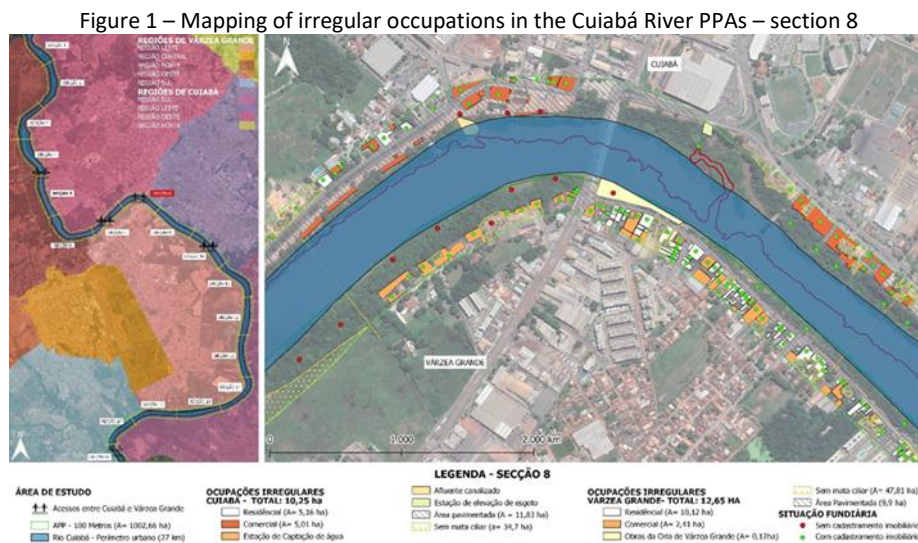
In all of eighteen prepared maps – for each section, a matrix map was inserted on the left side, making it possible to observe the entire route studied. On the right side the in the enlarged scale section. For a better understanding over the study conducted, four of the eighteen mapped sections were chosen to demonstrate the most emblematic occupations pattern identified in loco, which are presented below.

Still in the third phase of the research, which consisted of analyzing and interpreting the data observed in the clipping area, that is, analyzing the theoretical and empirical questions, discussions were conducted, considering the main occupations characteristics mapped in the PPAs under study. In this phase, there was a perception that was necessary to enlarge the research to the Cuiabá River sub-basins and select water streams in Cuiabá and Várzea Grande cities to verify and study how the process of their PPAs occupation occurred.

## 4 RESULTS

The territorial clipping characterization (Cuiabá and Várzea Grande) performed by the survey over the areas with irregular occupations in the PPAs and mapping the Cuiabá River extension inserted in the urban perimeter, pursued categorize the areas with paving, areas without riparian forest, residential occupations and within the PPA on the right bank, where the Cuiabá city is located, and on the left bank, where the Várzea Grande city is.

For this study, the section 8 (Figure 1) of the mapping was selected as demonstrative purposes, which covers the protection strip located in the West and East Regions of Cuiabá and in the East Region of Várzea Grande, which has the highest occupation, being commercial occupations the most expressive. In both cities, land is private and classified in an Environmental Interest Zone.



Fonte: Adaptado de Google Earth, 2021 e IBGE, 2020.

This part comprises the territorial portion where the Cuiabá and Várzea Grande shores are located and an access point between the cities, the Júlio Muller bridge, initially built in 1942 and duplicated in 1985. In 2014, with the World Cup works, it was “triplicated” to include the VLT rails, although this third track is not being used.

Is at this territorial portion where is found a sewage pumping station (marked on the map – close to the bridge), where the Prainha stream flows into the Cuiabá River, whose PPAs are completely urbanized, and its course serves as a channel for the sewage that has the Cuiabá River as a destination.

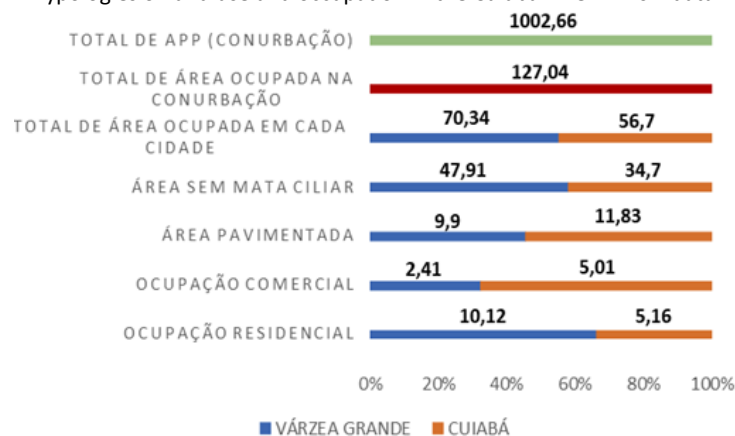
As this mapping result, it was identified on the Cuiabá Riverbanks – urban perimeter, that the surrounding neighborhoods total population adds up to 142,950 inhabitants, with 53,580 in Cuiabá and 89,370 in Várzea Grande.

It is appropriate emphasize that most of the water collection points for treatment and distribution to serve the population are in the most urbanized part of the referred cities and with the highest incidence of irregular occupations in PPAs. Therefore, potentially polluting, and degrading areas of this watercourse are considered.

In the investigated Cuiabá River portion, on the left bank downstream of the river, which comprises the Cuiabá city, the irregular occupations total area mapped in the PPAs, was 56.7 hectares, which, 5.16 hectares are residential occupations, 5.01 hectares are commercial occupations, 11.83 hectares are paved areas and about 37.7 hectares do not have riparian forest, thus leaving the soil exposed.

In the Cuiabá River right bank PPAs, belonging to the Várzea Grande city, the total amount of irregular occupations in PPAs mapped and diagnosed as unsuitable for a PPA, were 70.34 hectares, which 10.12 hectares are residential and 2.41 hectares are commercial undertakings, 9.9 hectares of paved area and 47.91 hectares of areas without riparian forest, resulting from improper occupations that continually degrade the riverbanks in several ways, whether removing the riparian forest, producing garbage and sediments that end up in its bed as a result of rain or waterproofing the soil (Graph 1).

Graph 1 – Typologies of land use and occupation in the Cuiabá River APPs – data in hectares



Source: Org. by the author, 2021.

From the founded results, the appropriation by housing occupations in the PPAs in greater quantity identified on the banks of the river where Várzea Grande is located can be

associated, among other factors, with the lower income class when compared to the rates presented for the Cuiabá city.

The importance performed by the Cuiabá River since the emergence of the first cities around it, has always permeated transportation, survival (fishing) and culture. Currently, with the increasing degradation of its banks and its waters contamination by sewage from large urban centers, reality has changed. It is not safe to feed its fish, nor to have contact with its waters, generating a view of non-appreciation and non-recognition of the river in its diverse potentialities.

However, considering these aspects, it was realized that the occupations in the Cuiabá River PPAs alone are still not so expressive as to degrade its waters and its aquatic fauna quality, so important for the riverside dwellers, for the population that is supplied by its waters and for the biomes to which it is inserted.

Analyzes realized by the Environment Secretary of State (SEMA-MT) showed that the Cuiabá River has presented high values of total coliforms, E. coli and electrical conductivity. While the Cuiabá River stations within Cuiabá and Várzea Grande urban perimeter “(especially the Barbado and São Gonçalo Beira Rio stations) are under strong influence of the urban perimeter, and therefore, have shown poor water quality (MATO GROSSO, 2018, p. 90).

Along the years, there has been a gradual deterioration in water quality standards in the rivers of the Paraguay Hydrographic Basin, especially in the Cuiabá River. Therefore, SEMA-MT recommends that intervention should be planned and executed to face this problem, “which can compromise the multiple uses of water on these areas, mainly fishing, leisure and public supply, which are one of the uses more common in these rivers” (MATO GROSSO, 2018, p. 91).

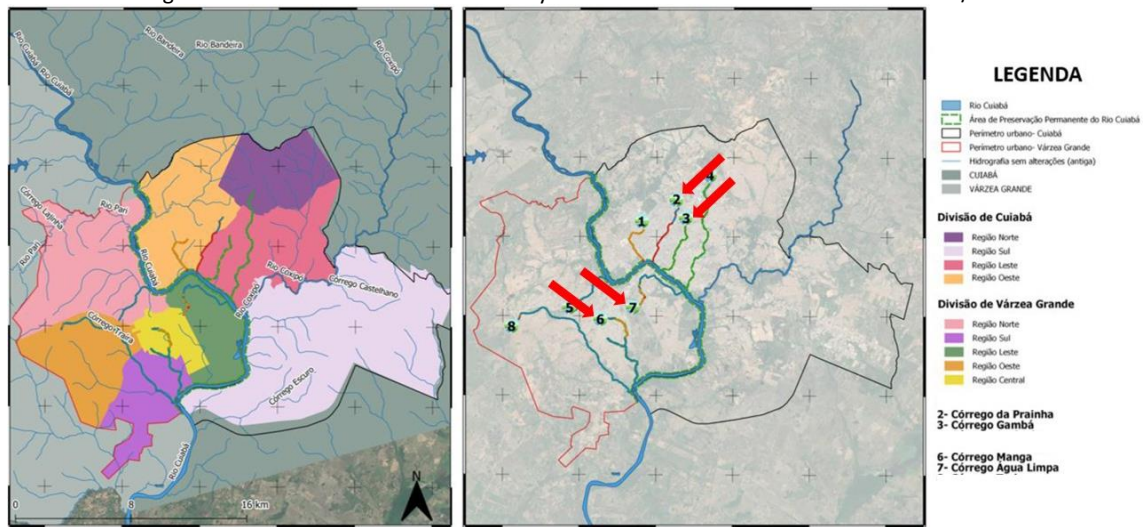
For SEMA-MT, the rivers of Paraguay River Basin “have shown a gradual loss in the water quality, especially the Cuiabá River within the Cuiabá and Várzea Grande urban perimeter” (MATO GROSSO, 2018, p. 110).

Based on the results of the water quality analyzes of the Paraguay Hydrographic Basin, performed by SEMA-MT, added to the advance by irregular occupations in the Cuiabá River Permanent Preservation Areas, it was recognized that the analysis resulting from the spatialization of data referring to the occupations identified on the Cuiabá Riverbanks, were mild considering the landscapes and quality of water degradation.

Faced with such results, it was important to investigate the physical territorial context of the main streams that flow into Cuiaba River. For that, a sample was defined selecting two streams in each city - Cuiabá and Várzea Grande, the choice of these streams considered their location, that is, all have their course in the urban perimeter, historical importance for both under study cities formation, and with similar physical characteristics such as the lack of afforestation and greater population density in their surroundings.

At Cuiabá, the Prainha and Gambá stream were chosen (Figure 2), and at Várzea Grande, Água Limpa and Manga stream were chosen.

Figure 2: Location of urban streams analyzed in Cuiabá and Várzea Grande - RMVRC/MT



Source: IBGE, 2020. Org. by the author, 2021.

For this study, it is important highlight that the urban streams of the two cities have their sources at higher points, thus flowing into the Cuiabá River. This water path created naturally by the topography, causes all sewage from urban areas to be directed to the Cuiabá River, compromising the water quality, which demonstrates that this type of pollution is not linked only to the precarious settlements of PPAs on their banks. but comes from other urbanized river basins.

Faced with this situation, the urban streams analysis was concerned identifying the neighborhood where they originate, demarcating the PPAs in line with the Forestry Code Law nº 12.651/2012, demarcation of non-buildable strips – Law nº 6.766/79, as well as verifying the basic sanitation quality along the stream and whether there is clandestine sewage discharge along its course.

## 4.1 Analysis of urban streams in Cuiabá - MT

### 4.1.1 Prainha stream

The Prainha stream (Figure 3), is a historic landmark in the Cuiabá urbanization process, its source is located at Bairro Alvorada with 13,035 inhabitants, in the East Region of Cuiabá. currently its course is channeled closed, runs through the Araés neighborhoods, with a population of 5,556 inhabitants, North Center with 2,510 inhabitants, Baú with 2,099 inhabitants, South Center with 4,062 inhabitants, Dom Aquino with 10,973 inhabitants and Tercero with 2,143 inhabitants.



Figure 3: Map of the Prainha Stream- Cuiabá/MT



Source: IBGE, 2020; Google Earth, 2021. Org. by the author, 2021.

With an extension of approximately 4,600 meters, of these only 100 meters are without channeling, that is, the stream is completely channeled, a small part with open channeling and about 3,500 meters of closed channeling until it flows into the Cuiabá River.

Regarding the sewage type in the neighborhood's confluent with the Prainha creek, it should be noted that in this stream the types of sewage are used in a considerable number of rudimentary means of disposal, directly affecting the water quality in its course and consequently in Cuiabá River.

Currently, most of the sewage generated in this area “is dumped directly into the Prainha Stream, which acts as a primary collector for rainwater and sewage in the concessionaire's sewage system” (AQUINO, 2020, p. 54).

Along its length, intense urbanization can be observed, oscillating between residential occupations, commerce, and paved roads. Its PPAs are completely anthropized, not following what determines Law nº 6.766/79, nor the Forestry Code, Law nº 12.651/2012.

Cases of overflow of the Prainha Stream on days of heavy rain are very recurrent, due to the interventions suffered by it, and in these episodes the population is susceptible to the proliferation of diseases since the stream is also a sewage collector.

During the on-site visit, it was possible to reach the sewage pumping station located at the same point where the Prainha stream flows, the unpleasant smell is intense and the conditions verified are alarming, all the sewage from the sub-basin goes to the riverbed Cuiabá without proper treatment, which is required by Conama Resolution 430/2011.

Faced with this chaotic scenario, resulting from the impacts of several interventions that comes from an ineffective management system, on the fragile system of watercourses, it is possible to perceive the local public policies obsolescence that involves this theme and the necessity to restructure it, recovering the environmental importance and appreciation of water bodies by and for the population.

#### 4.1.2 Gambá Stream

The Gambá Stream source (Figure 4), is concreted as a tank, it is located at D. Palmira Pereira Dias Plaza at Lixeira neighborhood, in the East Region of Cuiabá. The Lixeira neighborhood has 4,420 inhabitants, along its course, the stream passes through the Areão neighborhood with 5,533 inhabitants, through the Poção neighborhood with 4,442 inhabitants, Dom Aquino with 10,973 inhabitants and Terceira with 2,143 inhabitants.

Figure 4: Map of the Gambá Stream - Cuiabá/MT



Source: IBGE, 2020; Google Earth, 2021. Org. by the author, 2021.

With approximately 3,800 meters of total length, except for about 220 meters without channeling, the remaining stream course was completely rectified, with channels open until it flows into the Cuiabá River.

This stream is completely degraded, its banks do not have vegetation, in addition to receive diverse types of solid and liquid waste throughout its path, it not only receives rainwater, but also sewage that is sent directly from houses through clandestine pipes without treatment, causing intense unpleasant smell and disease proliferation.

As for the type of sewage along the Gambá creek course, in the Areão neighborhood there is a considerable number of households whose sewage is destined directly into water bodies. It should also be considered that the total amount of households that have a general sewer and rainwater system, there is no service in its entirety in terms of quantity or quality of the service provided.

It is noted that on its banks there is intense urbanization, all are occupied by low-income housing in greater numbers, not respecting environmental and urban legislation.

In this place, the images explain critical scenarios, marked by precariousness and unhealthy conditions. It is possible to observe that the stream had its course altered at some points, so it was necessary to build a plumbing system with an energy sink to contain the water at the mouth, thus taking the contaminated water, and the various types of waste that will travel through the Cuiabá River waters, taking part of the city's waste to other places, such as the Pantanal, for example.

To face these problems, no programs, actions, or even prevention or recovery measures have been implemented in these areas, although there is an apparatus of normative

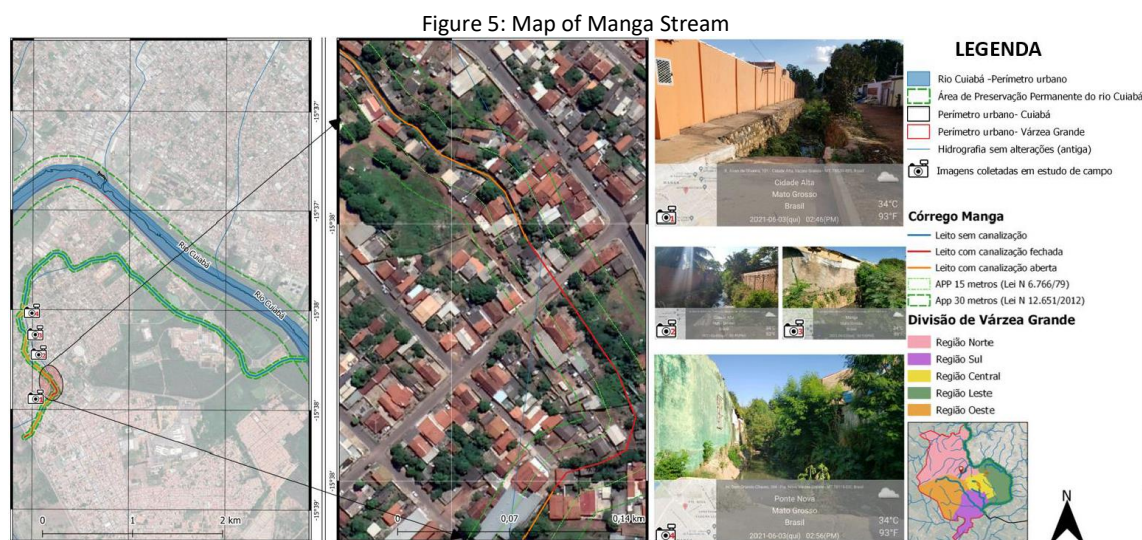
instruments applicable to the existing context. In a way, these facts show the lack of planning, reinforcing the need to study the problem, in which the city really turned its back to the rivers, failing to correctly integrate the natural elements in the process of (re)production of the city in favor of healthy quality of life, and urban sustainability. Since when dealing with sustainability the city would move towards a desirable social, environmental, and economic development.

From this conception, the dimensions encompassed by sustainability point towards a fairer and above all healthy city, a much-needed condition for reversing the situations presented here.

## 4.2 Analysis of urban streams in Várzea Grande – MT

### 4.2.1 Manga Stream

The Manga Stream (Figure 5), its source is located at Centro Norte neighborhood (within the Marechal Rondon International Airport area), in the Várzea Grande Central Region, with an HDI of 0.739, this neighborhood had in 2010 about 4,496 inhabitants. From this neighborhood, it runs through the Ponte Nova neighborhood with about 16,343 inhabitants, also with High Human Development (0.739), along its route, the stream passes through the Cristo Rei neighborhood with 29,502 inhabitants, HDI of 0.742, both in the East Region of Várzea Grande.



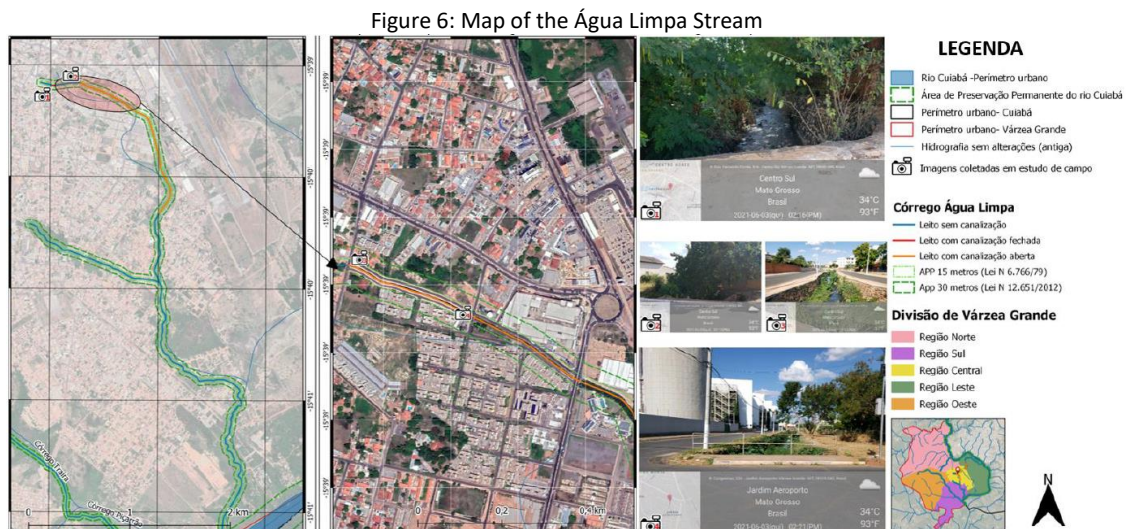
Source: IBGE, 2020; Google Earth, 2021. Org. by the author, 2021.

This stream has the largest number of inhabitants on its confluent neighborhoods, which severely impact the quality of the permanent preservation areas found during the field visit. At the site, extremely strong sewer odors were found, as well as many clandestine sewer connections and a lot of garbage on the banks and inside its course.

The population concentration is more pronounced around this stream, as it is located at one of the oldest Várzea Grande regions. This place also has the highest population density in the city and consequently, due to the disorderly growth, occupations and serious environmental impacts occurred on its margins.

## 4.2.2 Água Limpa Stream

The Água Limpa stream source (Figure 6) is located at Centro Sul neighborhood in the Várzea Grande Central Region. In 2010, this neighborhood had around 20,134 inhabitants and an HDI of 0.849, considered extremely high. Its bed also runs through the Costa Verde neighborhood with 7,895 inhabitants with an HDI of 0.767 considered high and the Vitória Régia neighborhood, which has 3,136 inhabitants, both in the southern city region.



Source: IBGE, 2020; Google Earth, 2021. Org. by the author, 2021.

This stream presents an emblematic situation in the city context because it is in the city center, one of the busiest regions and jobs and services generator. Thus, this stream has its banks densely occupied and is the scene of constant flooding in the area, as its impermeable bed does not support the rainwater flow and easily overflows. In 2017, the parking lots at Várzea Grande Shopping, which was built within the PPA, flooded.

The images on the figure (6) show the banks and the water of the stream situation, there is a very dense sewage layer above a small layer of water that drains and flows with this waste into the Cuiabá River. In the mapping images (Figure 6) it is possible to verify the presence of rubbish, a reflection the absence of environmental education practices and other values, and the lack of infrastructure, waste containers in the streets, selective collection, and environmental awareness about the importance of these attitudes.

During the field study, it was verified that the four streams PPAs (both of Cuiabá and both of Várzea Grande) are completely anthropized, they do not follow the municipal urban legislation, since they advocate what determines the Forest Code, Law nº 12.727, of 2012, which establishes in art. 4, item I, that permanent preservation areas, in rural or urban areas, must be maintained, however, the impracticability of this law was verified throughout its bed.

Therefore, within this study scope, it was also relevant to verify to what extent the urban land subdivision legislation Law nº 6.766/79 was being observed in the establishment of non-buildable strips, as defined in its chap. II, item III-A, “along running and dormant waters and the railroad domain strip, it will be mandatory to reserve a non-buildable strip at least 15

(fifteen) meters on each side”, that is, it was found that there has been no application of environmental legislation or even subdivision of land on the banks of these streams, although the restrictions are smaller.

## **5 FINAL CONSIDERATIONS**

The research identified that the PPAs, at the banks of Cuiabá River as well as the urban streams, its tributaries, are in an advanced process of environmental degradation consolidating them as cities with their backs to the river. This demonstrates that the urban environmental conflicts verified by the research have been intensifying over the years, evidencing the urgency of state actions to face them.

There is an accentuated environmental degradation in the region, particularly in the water bodies, which suffer both open and closed channeling processes, preventing streams from following their natural course. Its beds are polluted, with no riparian forest, bordered by irregular occupations and streets. In addition to serving as “collectors” of domestic and industrial sewage, in most cases observed, they are also characterized as open-air rubbish and debris deposits. This is the result of the accelerated and disorderly process of urbanization and the lack of efficient planning.

Within the discussion ambit held, the urban PPAs need to be preserved, as they contribute to the landscape, natural patrimony and built enhancement, have ecological, historical, cultural, landscape and tourist values by exercising multiple functions, especially social and educational ones, aiming at their conservation and contemplation, which benefit and promote a quality-of-life improvement to the population.

The survey during the mapping and on-site data collect found the irregular occupations occurrence - from different kind of uses (residential and commercial) both on the right and left Cuiabá Riverbanks, as well as on the affluent streams. Even more critically, these waterbodies, due to a lack of sanitation services, have been used as open sewer and domestic waste release, even know that their preservation is essential for improving the climate, mitigating the events that are intensifying every year, such as water crises resulting from increasingly frequent and severe droughts, since the Cuiabá River Basin has experienced several impacts caused by anthropic actions over the years.

Cuiabá and Várzea Grande are cities that exemplify the event described above, as their landscapes do not present elements that value the landscaping and environmental potential of their river. In a contradictory situation, its landscapes display a series of buildings – residential, commercial, and institutional – located with their backs to the river, constituting a physical barrier that limits visual and physical access to its banks.

It is understood, therefore, that the protection of PPAs in waterbodies is essential to ensure the water quality to maintain the ecological balance of the aquatic ecosystem, to maintain life in these environments, and especially for its noblest use. which is human consumption.

Faced with these scenarios, it is imperative that these concerns about the preservation areas occurs, however, more important than the concern is the action, inspection, and decent housing implementation, so that the population may have a suitable place to live. After all,

nobody lives in a risk area by choice, but by social necessity.

In general terms, the Cuiabá River plays a very important role to Mato Grosso state, bringing life wherever it goes, suppling cities with water, feeding the riverside population with fish, and in the flood's periods, its waters flood fields, and lakes, thus sustaining biodiversity in the Pantanal plain.

In short, this research found that cities have their backs to the river based on three main aspects: the first is the urban population increasing that has occurred unbridled and unplanned, resulting in irregular PPAs occupations; the second aspect refers to the non-availability of efficient public policies aimed at housing, mainly to the population with lower purchasing power; and the third aspect evidenced, is the low rates of public services provision such as basic sanitation, because if there were effective sanitation, the waste would not being released daily into the water bodies of the cities.

Initially, it was thought that the answer to the central question proposed by the research - “cities back to the river”, understood as their potential non-recognition, was due to the permanent preservation areas mischaracterization. However, these areas reality was verified in loco, where the precarious situation linked to unsanitary conditions, such as the unpleasant smell coming from the sewers in the streams, has caused a serious impact on the population life, which justifies – to a certain extent, its denial, turning the back to it.

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