



## **Investigation of Urban Parks and their Connection with the Real Estate Sector in Cuiabá, Mato Grosso**

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#### ABSTRACT

The continuous demographic growth in urban areas is one of the aspects that highlights, above all, the debate on environmental issues related to the development of cities and real estate expansion close to green areas. It is worth highlighting that green areas tend to increase the value of nearby properties, increasing their sales value or attracting new investments, which use green spaces as a business strategy. Therefore, urban parks become an element of appreciation for the region in which they are located. In this sense, the objective of this study is to investigate urban parks located in the northern region of Cuiabá/MT, from 2005 to 2020. To do this, it was necessary to classify the soil according to use and occupation and use the Generic Values Plan, to check the value per m<sup>2</sup> defined by the Municipality of Cuiabá. As a result, it was possible to classify urban use and occupation, as well as the value per square meter of streets in the period studied. It is observed that among the parks studied in the northern region, Massairo Okamura Park was the most valued during the years analyzed.

**KEYWORDS:** Green areas. Real estate speculation. Urban expansion. Urban planning.

#### 1 INTRODUCTION

According to the United Nations - UN (2020), "55% of the world's population lives in urban areas and this proportion is expected to increase to 70% by 2050", which will bring new challenges to administrative managers regarding the sustainability of urban centers (VIDAL et al., 2020, p. 427).

The accelerated growth of cities, combined with inefficient urban planning, means that natural green areas are gradually being removed from the urban landscape, with negative repercussions on the quality of life of the people who live there (LOBODA; DE ANGELIS, 2005; LIMA; GARCEZ, 2017, p. 141).

Llardente (1982) mentions that the city is a grouping of interconnected components, systematizations and functions. For this reason, it is an effective reference to the importance of the evolution of open spaces, as they are essential in shaping urban cities (MARTINS; ARAÚJO, 2014).

In line with Carasek; Melo; Melo (2017, p. 57) aduz:

The need for urban green spaces has become increasingly unquestionable, occurring in parallel with the growth of cities. Public and private urban green spaces are becoming increasingly important in regional and municipal policies.

Llardente (1982, p.151) categorizes urban green space systems in three ways:

- Open space systems: A set of urban open spaces intended for pedestrians to rest, stroll, play sports and, in general, recreate and entertain themselves during their leisure time.
- Open space: Any of the different green areas that make up the open space system.
- Green areas, green spaces, green areas, green equipment: Any open space in which planted areas of vegetation predominate, generally corresponding to what are known as parks, gardens or squares.

In addition, for Magnoli (1982), open space systems (OSS) are spaces free of buildings, such as gardens, backyards, streets, sidewalks, squares, parks, forests, rivers, or urban voids. In

relation to public urban green spaces, these are classified as urban parks, squares, botanical gardens, among others.

Using Pereira Lima's (1994) concept, a green area is considered to be a space where there is a greater predominance of tree vegetation, and is also categorized as: public gardens, squares, urban parks. As for urban parks, the author explains that they are spaces with an ecological, leisure and aesthetic function.

Urban parks stand out for the benefits they can bring to the health and well-being of the population (BOVO; CONRADO, 2012). In the specific literature, there are countless references to the importance of green areas, particularly their benefits for improving thermal, visual, environmental and psychological comfort, thus minimizing the daily stress of city dwellers. Henrique (2006, p. 67) aponta que a qualidade de vida da população está ligada ao estado socioeconômico, vinculados a infraestrutura oferecida, mas também é de fundamental importância que elementos naturais sejam relevantes no planejamento urbano. According to the author, there is a marketing approach when it comes to the natural environment. From a profit-oriented perspective, nature ends up becoming a mere commodity, which is valued to the detriment of the financial value it will generate for agents.

Green areas tend to increase the value of nearby properties, increasing their rental value or attracting new investments that use green spaces as business strategies. The creation of new parks and green open spaces can directly and indirectly stimulate new businesses focused on leisure and related activities, such as food, sport and leisure, promoting an increase in local jobs and tax collection (NY/NJ BAYKEEPER, 2006; LERNER; POOLE, 1999).

Harvey (2000) describes that real estate agents often value a certain area, such as revitalizing spaces in the city, for their own profit. These aspects help us to understand what has been happening in certain regions that clearly receive financial incentives, being more valued, receiving greater visibility, and investments of public capital, to the detriment of poorer regions. It is this difference that influences the production of the urban landscape, since this social discrepancy is determined by economic indicators. (HENRIQUE, 2006, p.68)

Based on this scenario, the general objective of this article is to investigate the relationship between the main urban parks in the northern region and real estate appreciation in Cuiabá/MT between 2016 and 2020.

## 2 METHOD

The methodology used to prepare this article was data collection through bibliographic and documentary analysis in literature reviews, journal articles, regulations, laws, decrees, resolutions and mapping.

In order to investigate the urban parks in the northern region of Cuiabá/MT, between 2005 and 2020, it was necessary to classify the land in terms of use and occupation, using the methodological approach of Barton and Tsourou (2000), which proposes the delimitation of a 1km radius from the edge of the parks, seeking to categorize the various types of use (vertical/horizontal residential, commercial, corporate, mixed use and institutional) and occupation (building, paving, green areas) of the land.

As for real estate appreciation, we used the Generic Values Plants (PVG), a parameter used to support the calculation of the Urban Property Tax (IPTU) provided by the Cuiabá City Hall (PMC), with the aim of verifying the existence of real estate appreciation around the parks.

The Planta de Valores Genéricos (PVG) is a regulatory instrument formulated by town halls with the help of local agents, to obtain property values, in this case land values. It is a reference mechanism developed using calculations that make it possible to obtain the market values of the municipality's urban properties, based on the individual valuation of each property, serving as the basis for taxes such as IPTU (Imposto Predial e Territorial Urbano), ITBI (Imposto sobre Transmissão de Bens Imóveis) e Improvement Contribution. (CÂMARA MUNICIPAL,2020)

In this sense, the value per m<sup>2</sup> based on the street standard will be used to determine the value of the land. The PVG was made available by the PMC from 2016 (Figure 01). Therefore, the values per m<sup>2</sup> from 2016 and 2020 will be used in order to relate them to the data obtained from the land use and occupation classification.

Figure 01 - Table of sales values for 2016 and 2020.

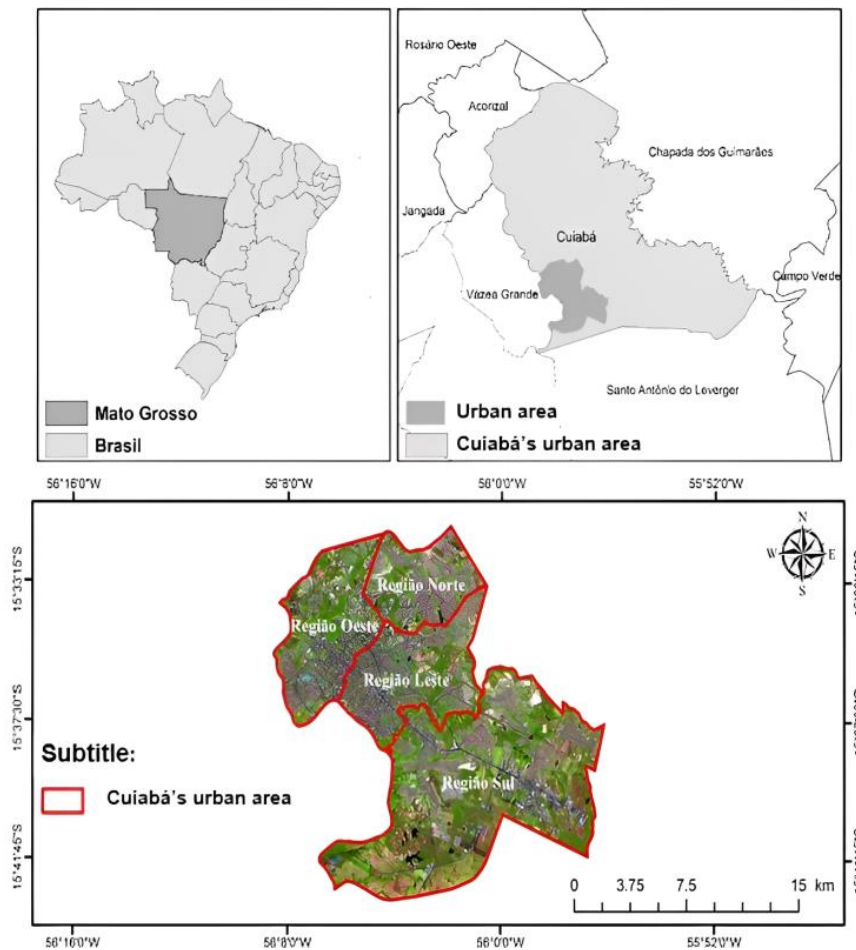
Sales values for 2016 and 2020											
Street pattern	2016 (R\$/M <sup>2</sup> )	2020 (R\$/M <sup>2</sup> )	Street pattern	2016 (R\$/M <sup>2</sup> )	2020 (R\$/M <sup>2</sup> )	Street pattern	2016 (R\$/M <sup>2</sup> )	2020 (R\$/M <sup>2</sup> )	Street pattern	2016 (R\$/M <sup>2</sup> )	2020 (R\$/M <sup>2</sup> )
1	0,60	0,83	41	200,00	290,78	81	455,00	1.196,34	121	955	3.821,63
2	1,00	1,66	42	205,00	299,08	82	465,00	1.229,57	122	965	3.987,79
3	1,50	4,98	43	210,00	307,39	83	480,00	1.246,18	123	985	4.153,95
4	10,00	8,31	44	215,00	315,70	84	490,00	1.262,80	124	1.000,00	4.320,11
5	15,00	13,29	45	220,00	324,01	85	495,00	1.296,03	125	1.010,00	4.486,26
6	20,00	16,62	46	225,00	332,32	86	500,00	1.329,26	126	1.025,00	4.652,42
7	25,00	19,94	47	230,00	348,93	87	505,00	1.362,50	127	1.065,00	4.818,58
8	30,00	24,92	48	235,00	365,55	88	515,00	1.395,73	128	1.080,00	4.984,74
9	35,00	29,91	49	245,00	382,16	89	520,00	1.412,34	129	1.150,00	5.150,90
10	40,00	33,23	50	250,00	398,78	90	530,00	1.428,96	130	1.200,00	5.317,05
11	45,00	41,54	51	255,00	415,39	91	535,00	1.462,19	131	1.255,00	5.483,21
12	50,00	49,85	52	260,00	432,01	92	545,00	1.495,42	132	1.265,00	5.649,37
13	55,00	58,16	53	270,00	448,63	93	575,00	1.528,65	133	1.290,00	5.815,53
14	60,00	66,46	54	275,00	465,24	94	585,00	1.561,88	134	1.295,00	5.981,69
15	65,00	74,77	55	280,00	481,86	95	590,00	1.578,50	135	1.360,00	6.147,84
16	70,00	83,08	56	290,00	498,47	96	595,00	1.595,12	136	1.410,00	6.314,00
17	75,00	91,39	57	295,00	531,71	97	605,00	1.628,35	137	1.430,00	6.480,16
18	80,00	99,69	58	300,00	564,94	98	610,00	1.661,58	138	1.465,00	6.646,32
19	85,00	108,00	59	305,00	581,55	99	630,00	1.744,66	139	4.505,00	
20	90,00	116,31	60	310,00	598,17	100	635,00	1.824,74	140	1.585,00	
21	95,00	124,62	61	315,00	631,40	101	645,00	1.910,82	141	1.650,00	
22	100,00	132,93	62	325,00	664,63	102	670,00	1.993,90	142	1.710,00	
23	105,00	141,23	63	330,00	697,86	103	675,00	2.076,97	143	1.745,00	
24	110,00	149,54	64	335,00	731,09	104	680,00	2.160,05	144	1.850,00	
25	115,00	157,85	65	345,00	747,71	105	685,00	2.243,13	145	2.000,00	
26	120,00	166,16	66	355,00	764,33	106	700,00	2.326,21	146	2.150,00	
27	125,00	174,47	67	365,00	797,56	107	705,00	2.409,29	147	2.365,00	
28	130,00	182,77	68	375,00	830,79	108	720,00	2.492,37	148	2.500,00	
29	135,00	191,08	69	380,00	864,02	109	730,00	2.575,45	149	2.700,00	
30	140,00	199,39	70	390,00	897,25	110	745,00	2.658,53	150	2.850,00	
31	145,00	207,70	71	395,00	913,87	111	760,00	2.741,61	151	3.000,00	
32	150,00	216,01	72	400,00	930,48	112	775,00	2.824,69	152	3.200,00	
33	160,00	224,31	73	405,00	963,72	113	800,00	2.907,76	153	3.350,00	
34	165,00	232,62	74	415,00	996,95	114	825,00	2.990,84	154	3.500,00	
35	170,00	240,93	75	420,00	1030,18	115	830,00	3.073,92	155	3.700,00	
36	175,00	249,24	76	425,00	1063,41	116	860,00	3.157,00	156	4.000,00	
37	180,00	257,54	77	430,00	1080,08	117	870,00	3.240,08			
38	185,00	265,85	78	440,00	1096,64	118	890,00	3.323,16			
39	190,00	274,16	79	445,00	1129,87	119	915,00	3.489,32			
40	195,00	282,47	80	450,00	1163,11	120	930,00	3.655,47			

When researching the current value of the square meter of buildings on the real estate market, a series of factors are taken into account regarding the infrastructure of the region and the location of the property, which directly affect the appreciation and depreciation of its value, for the preparation of the PVG, such as: security, access routes, availability of public services, proximity to commercial and service areas, possibilities for future developments, topography of the land, neighborhood and possible environmental risks and unhealthy factors.

### 3 SUBJECT OF STUDY

Cuiabá-MT (Figure 02), is located at latitude 15°35'46" south and longitude 56°05'48" west, with an average altitude of less than 200m above sea level. The area of the municipality is 3,538.17km<sup>2</sup>, of which 254.57km<sup>2</sup> corresponds to the urbanized area occupied by an estimated urban population of 623,614, in addition to being part of the Cuiabá River Valley Metropolitan Region, established in 2016, with an estimated population of 1,060,703. (IBGE, 2021).

Figure 02 - Map of the urban area of Cuiabá, MT, Brazil.



Source – SOUZA (2019), adapted by the authors.

The state is located at the meeting point of three important Brazilian biomes: the Pantanal, the Cerrado and the Amazon Rainforest, with the predominant biome in the municipality being the Cerrado. According to the socio-economic profile (2011), Cuiabá has environmental protection areas established by state and municipal authorities.

In all, Cuiabá has nine urban parks: Mãe Bonifácia Park; Water Park; Massaíro Okamura Park, Family Park, Tia Nair Park; Park Morro da Luz e o Park Zé bolo Flô, Park Lagoa Encantada e Park da Nascente (Figura 03).

Figure 03 – Urban perimeter of Cuiabá/MT, and the urban parks studied



Source – Google Earth, adapted by the authors.

It should be noted that the parks investigated for this article are those located in the northern region: Parque das Águas, Parque Massaíro Okamura and Parque da Família.

#### 4 RESULTS AND DISCUSSIONS

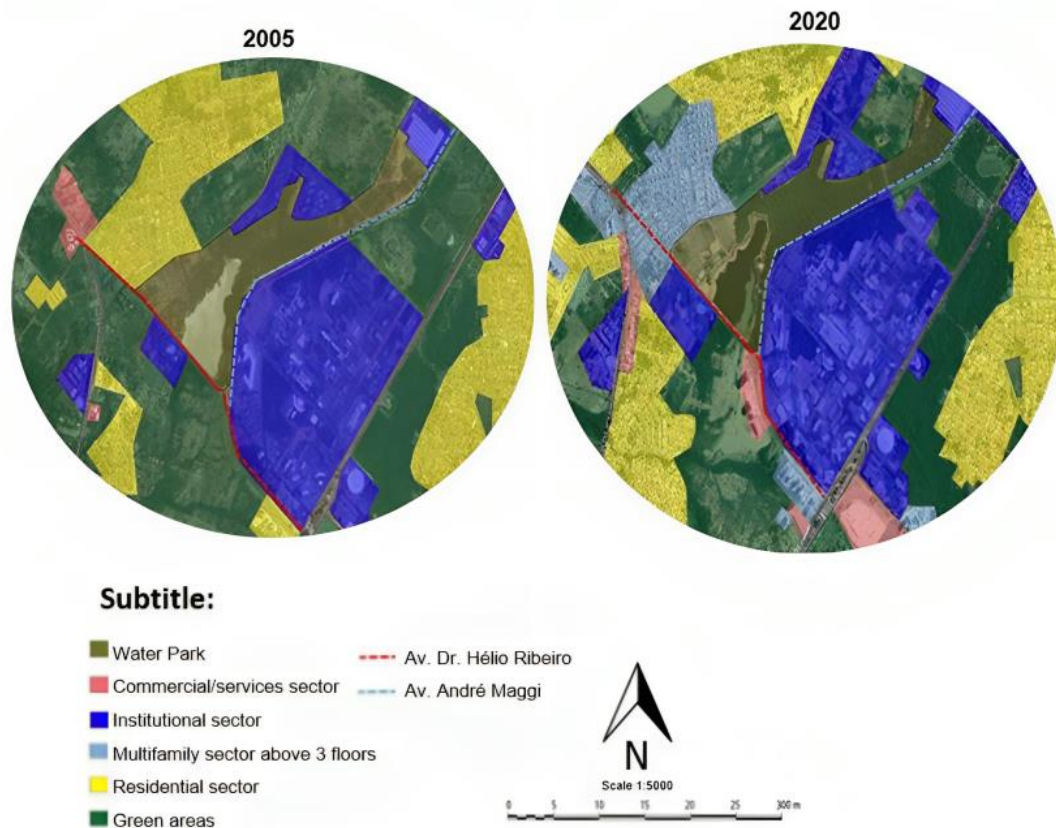
This section will present comparisons of land use and occupation between 2005 and 2020, as well as the changes identified in terms of the value of the m<sup>2</sup> in relation to the street standard between 2016 and 2022.

Parque das Águas is located in the Paiaguás neighborhood, in the northern region, has an area of 27ha, and is considered a conservation unit. It was inaugurated on December 30,

2016. It offers walking and cycling activities, as well as a structure for bars and restaurants. It has a lake where "water shows" are presented. It can be seen that in the early 2000s, the area had great potential for development, as it is located close to the Political Administrative Center.

Between 2005 and 2020 (Figure 04), there was a large amount of land and green areas in the park area in 2005. These areas have partially diminished over the years, by an average of 55.03%. However, in the area opposite the park in 2020, there are already open access roads, i.e. the areas have been parcelled out.

Figure 04 - Classification of land use and occupation in the Parque das Águas region.

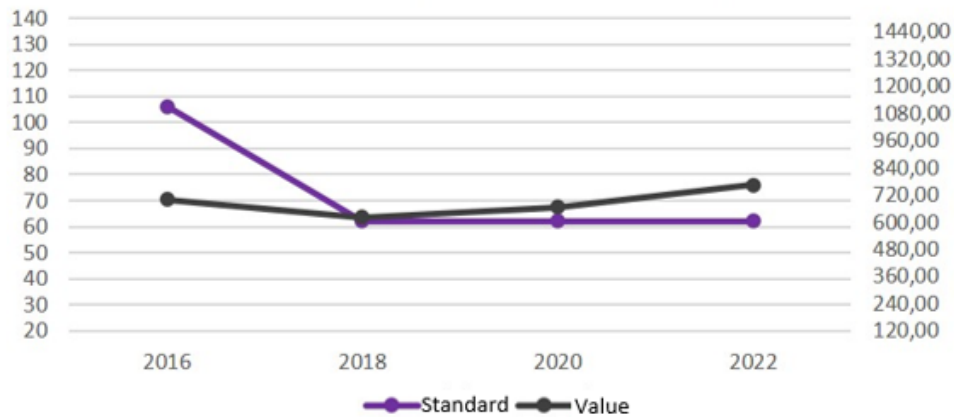


Source - Google Earth, adapted by the authors.

The institutional sector has grown considerably in the region, since almost all the secretariats of the State of Mato Grosso have their headquarters in the Centro Político Administrativo (CPA), as well as the Legislative and Judicial branches. Another sector that has increased over the years is residential housing, especially horizontal condominiums, an estimated 45.05%. However, on Avenida Dr. Hélio Ribeiro, which runs in front of the park, there is the presence of high-end multi-family housing, while the commercial sector is more related to companies and corporate centers.

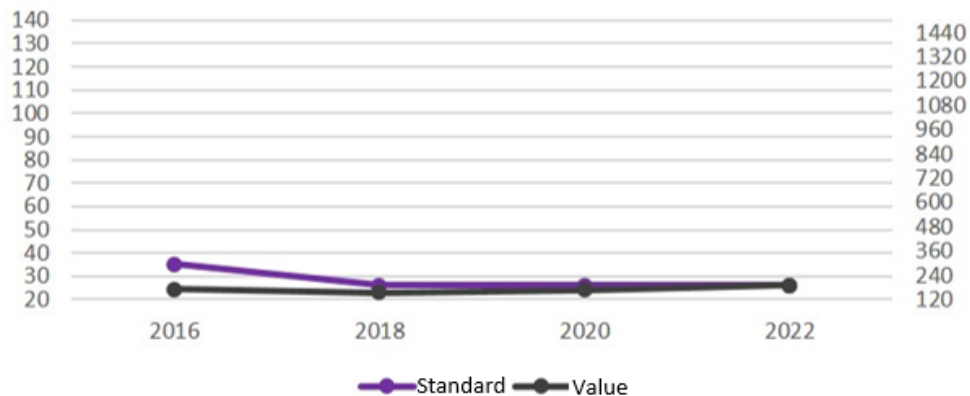
With regard to the PVG, on Av. André Maggi (Figure 05) the street standard in 2016 was 106, with a m<sup>2</sup> value of R\$700.00 and in 2020 the standard was raised to 62, with a m<sup>2</sup> value of R\$690.69, i.e. a drop of 1.33% over the 4-year period.

Figure 05 - Comparison of Street Standard and Value per m<sup>2</sup> between 2016 and 2022, on Av. André Maggi



Desembargador Carlos Avalone Avenue (Figure 06), in 2016 the street standard was 35, and the m<sup>2</sup> of the street was R\$170.00 and in 2020 the standard became 26, with an increase in the m<sup>2</sup> of R\$172.67, that is, an increase of 1.57% between the years analyzed.

Figure 06 - Comparison of Street Standard and Value per m<sup>2</sup> between 2016 and 2022, on Av. Desembargador Carlos Avalone.

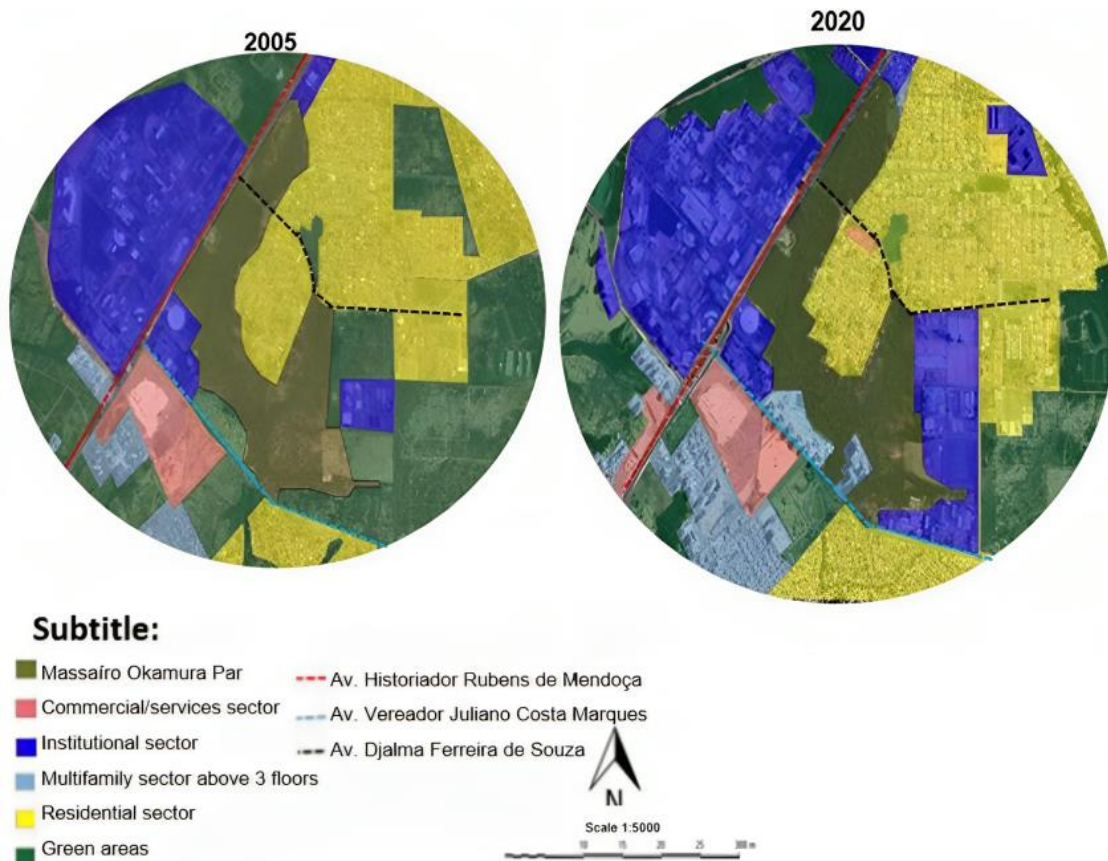


In the study carried out, the Massairo Okamura Park, located on Av. Historiado Rubens de Mendonça, in the northern region, opened on April 8, 2004, has a total area of 51ha, is considered a Conservation Unit, with fragments of the Amazon rainforest. It contains the source of the Barbado stream and offers a viewpoint and physical activity equipment for users.

When comparing the years 2005 and 2020 (Figure 07), it can be seen that in 2005, the park's region had single-storey residential areas, but there were many urban voids to be filled. In 2020 there was an increase in multi-family housing in the area surrounding the park, including in an area that was part of environmental protection, an average growth of 184.84%.



Figure 07 - Classification of land use and occupation in the Massaíro Okamura Park region.



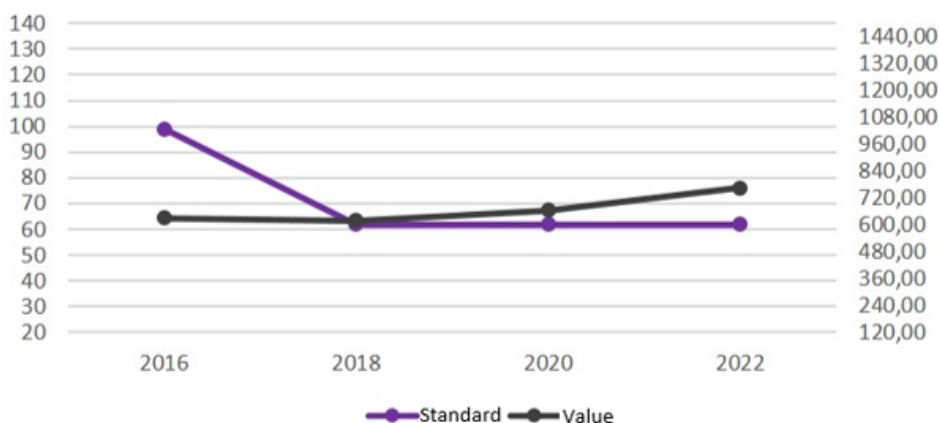
Source - Google Earth, adapted by the authors.

Av. Historiador Rubens de Mendonça is understood to be a structural road, with a strong presence of commerce, but what stands out near Massaíro Okamura Park is Shopping Pantanal, one of the developments that led to the region's appreciation.

As far as institutional areas are concerned, there is a large presence of these institutions in the vicinity of the park, due to the fact that it is located close to the CPA (Political Administrative Center), such as the State Legislative and Judiciary Branches; Trade Unions: Center of Events; Aquatic Park; Municipal School and the Federal Institute of Education - Bela Vista Campus.

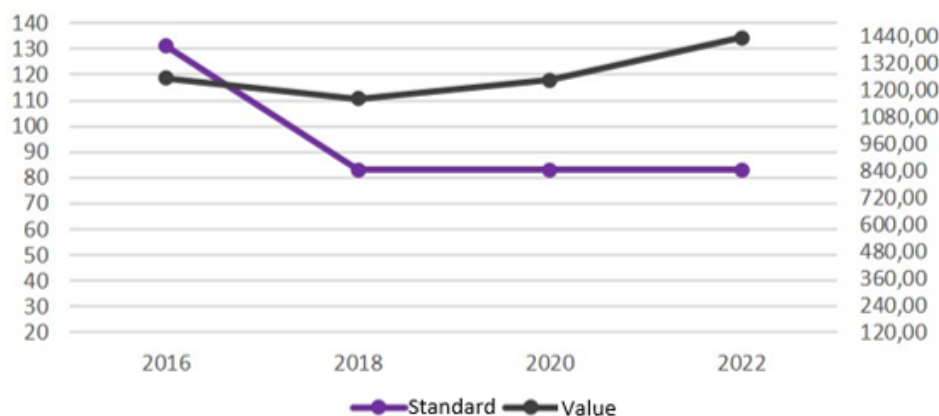
According to the PVG made available by the PMC, as of 2016 the street standard defined in the value plan was 99 and the value of the m<sup>2</sup> on Av. Historiador Rubens de Mendonça (Figure 08) was R\$630.00, rising to R\$764.39, the standard rose to 62 in 2020, resulting in an increase of 21.33% between the years analyzed.

Figure 08 - Comparison of Street Standard and Value per m<sup>2</sup> between 2016 and 2022, on Av. Historiador Rubens de Mendonça



On Av. Vereador Juliano da Costa Marques (Figure 09), in 2016, the street standard was 131, and the price per m<sup>2</sup> was R\$1,255.00, rising to R\$1,433.22 per m<sup>2</sup> in 2020, with the standard being 83 in 2020, reflecting an increase of 14.20% in 4 years.

Figure 09 - Comparison of Street Standard and Value per m<sup>2</sup> between 2016 and 2022, on Av. Vereador Juliano da Costa Marques.

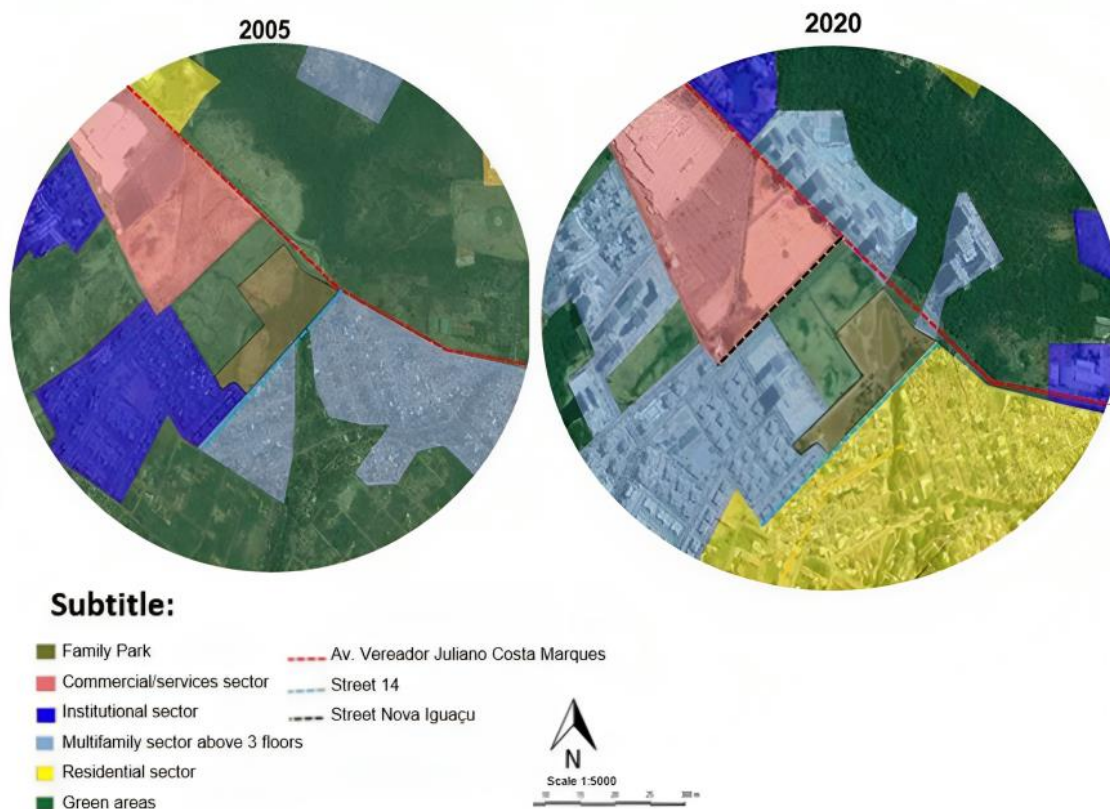


The Family Park, located on Av. Vereador Juliano Costa Marques, in the Terra Nova neighborhood, is in the northern region of Cuiabá and has a total area of 3.2ha. It was inaugurated on April 13, 2019, by Cuiabá City Hall, in partnership with Pantanal shopping center, which funded part of the park's construction. The area has internal walking trails, a soccer field and outdoor gyms.

With regard to the classification of land use and occupation over the 15-year period, there has been a considerable increase in residential buildings, around 54.07%, and multi-family multi-storey buildings of 57.92% in the Terra Nova neighborhood.

Like the Massairo Okamura Park, there are high-end vertical condominiums, but in the case of the Family Park, these condominiums are not adjacent to its boundary, i.e. they are on the other side of the Vereador Juliano Costa Marques Avenue.

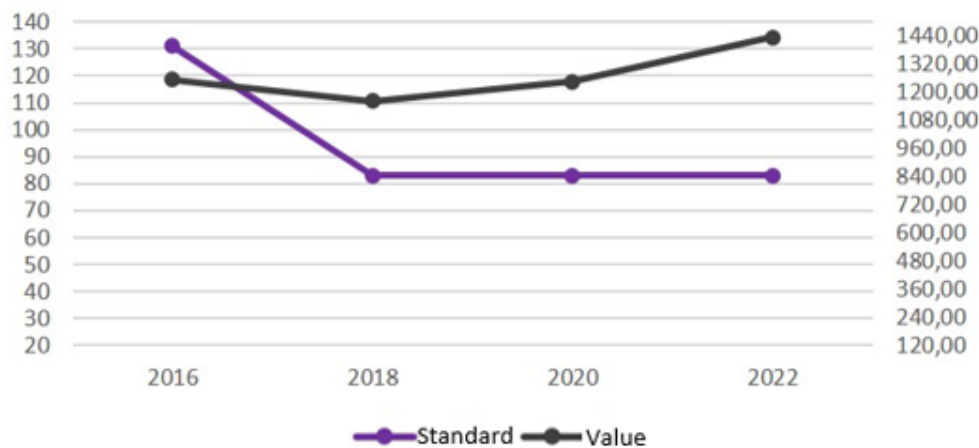
Figure 10 - Classification of land use and occupation in the Family Park region.



Source - Google Earth, adapted by the authors.

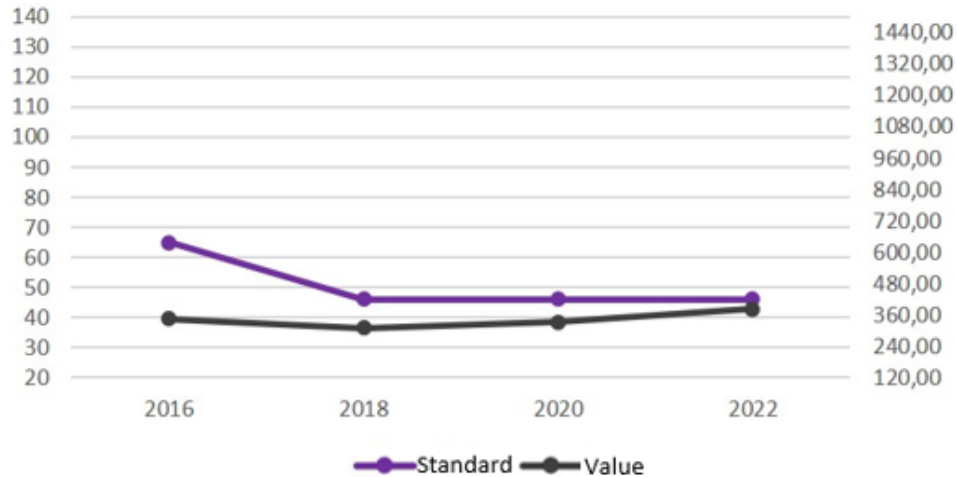
It can be seen that in 2016 the standard for Av. Juliano Costa Marques (Figure 11) was 131, with an assessed value of R\$1,255.00, however in 2020 the standard became 83, but the value increased to R\$1,295.04, i.e. an increase of 3.19% in 4 years.

Figure 11 - Comparison of Street Standard and Value per m<sup>2</sup> between 2016 and 2022, on Av. Vereador Juliano da Costa Marques



As for the other streets (Figure 12), the street standard in 2016 was 65, with a m<sup>2</sup> price of R\$345.00, in 2018 the standard became 46 until 2020 with a m<sup>2</sup> value of R\$382.19, an increase of 10.78%.

Figure 12 - Comparison of Street Standard and Value per m<sup>2</sup> between 2016 and 2022, other streets



In accordance with the classification of land use and occupation around the parks in 2005 and 2020, based on the studies carried out, it can be concluded that Parque das Águas had a greater presence of institutional areas, not least because of its location close to the state's political and administrative center. At the beginning of 2005, there was a great potential for growth in the region, as there were many empty areas, which changed over the years, with spaces already plotted, but not built on.

Although Massaíro Okamura Park is located close to the political center, there are more residential properties in the area and even within the park's old perimeter. Like the Family Park, it has a greater predominance of residential areas.

When analyzing the value of the m<sup>2</sup> of the street around the Urban Parks, based on the PVG, it was observed that the Park that had the highest appreciation was Massaíro Okamura, which is close to the political center and a Shopping Center.

In this way, the region with the highest appreciation, both financially and in terms of development, was the Parque da Família and Parque Massairo Okamura. However, it is worth remembering that there is a shopping center in the area of the parks mentioned, leading us to believe that the increase in value is not solely linked to the presence of the parks.

## 5 FINAL THOUGHTS

It can be seen that of all the parks studied, the most highly valued ones have good infrastructure, offer equipment, services, shops and public institutions, and are located close to structural or main roads, factors which positively influence their appreciation by real estate agents.

Therefore, it can be concluded that in the case of Cuiabá-MT, the urban parks investigated can be identified as inducers of growth and used as mitigators in the city's

urbanization process. However, it should be noted that they are not solely responsible for the region's growth, being associated with commercial and institutional uses to promote the appreciation of the neighborhood and its surroundings.

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