

**Landscape planning of the city of Cuiabá - MT: Case study of urbanized
green areas in the Westside**

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ABSTRACT

This research aimed to carry out an analysis of the quality of Urbanized Green Public Areas (AVPUs), such as squares, gardens and urban parks, which are intended for leisure and recreation in the contemporary city. As the focus of the study, the west area of the city of Cuiabá-MT was chosen. For the development of this qualitative research, methodological procedures were adopted that were based on a logical investigation, divided into three phases: open or exploratory, data collection and analysis and systematic interpretation of data. As a result, it was found that there is a lack not only in the amount of public spaces intended for leisure and recreation, as well as the quality of AVPUs that were found, which shows the absence of public policies aimed at the population.

KEYWORDS: Urbanized Green Public Areas. Contemporary City. Environmental Quality

INTRODUCTION

According to the Brazilian Institute of Geography and Statistics (IBGE) - 2010 Census, approximately 84% (eighty-four percent) of the Brazilian population lives in urban areas. To shelter this population, cities are produced at an increasingly accelerated pace, almost always disregarding the current urban norms, being at the mercy of the interests dictated by market laws. This is undoubtedly present in the production model of our cities, either through intense verticalization or by the disorderly expansion of cities in the country.

In the context of a contemporary Brazilian city, the Green Urbanized Public Areas (AVPUs), like squares, gardens and urban parks, should contribute not only to the leisure and recreation of the population in general, but also to improve the environmental quality in the urban space.

Jesus and Braga (2005, p. 208) state that environmental quality “is closely linked to quality of life, as life and the environment are inseparable. There is an interaction and a balance between the two that varies from scale to time and place.” For this reason, the urban space has become the stage for the attention of several researchers who, incessantly, seek the proposition of alternative techniques that will improve the environmental conditions of cities.

AVPUs are well known for their environmental benefits, such as: combating air pollution; regulation of air humidity and temperature; contribution to soil permeability, fertility and moisture, protecting against erosive processes; reduction of noise levels, serving as noise damper in cities, among others. In summary, they contribute to the environmental comfort of the places where they are located. In addition to these functions, there is the beautification of the city, as well as leisure and environmental comfort.

In view of the importance of the proposed theme, it was decided to carry out this qualitative analysis of AVPUs, with the focus on the western area of the city of Cuiabá-MT, which is justified by the environmental aspects of the site, as well as the lack of public spaces for leisure and recreation of the population.

STATE OF ART

This article provides a critical analysis for planning and public management in the context of contemporary cities. Thus, in the scope of the proposed investigation, in order to achieve a better understanding of the examination to be undertaken, it was necessary to insert key concepts, that is, those that present interfaces like those discussed here - among them

landscape, planning of landscape and areas, and public green issues as a subsidy to the empirical process of this research.

In this sense, it should also be emphasized that it is not intended to elaborate an exhaustive discussion regarding such concepts, but rather to present relevant aspects to each one, mainly due to the diversity of interpretations verified over time by countless studies in various fields of knowledge.

According to Benini (2015), issues related to the processes of natural and man-made changes that affect the landscape, especially in urban landscapes, can be assessed through a qualitative analysis to understand the phenomenon.

The concept of landscape “is the result of the balance between multiple forces and temporal and spatial processes” (LEITE, 1994, p. 7). In this sense, Magnoli and Macedo (2000, p. 132-133) consider that the expression “landscape” such as

[...] with broad, complex meanings, but rather vague, indistinct, incomplete; common premises were “nature” and censorship of man's action. The perception of natural changes - of biological times - and also those fast, extensive and diffuse in the work of man - of historical times - raised the relationship between man and nature again. It would be this relationship with all the appeals and judgments - imprecise, indefinite - that would be associated with the word "landscape".

This way, it can be said that the “landscape is like the morphological expression of the different forms of occupation, therefore, of changes in the environment in a given time” (MACEDO, 1999, p. 11).

Hence, the concept of environment can be synthesized as the interaction of society with physical support, whether it has an appearance commonly called “natural” or constructed. The interaction takes place in the geographical space through the adaptations, transformations, readaptations and new transformations of the successive forms found, elaborated and reworked. These conformations, configurations, loaded with social interaction with support we have called LANDSCAPES. (MAGNOLI, 1994, p. 60).

For Macedo (1999, p. 13), “ideas about landscape are directly linked to the concepts of habitat, mainly of space. Each landscape contains spaces, places where entire communities live, and may contain parts or all of diverse ecosystems.” For this reason, urban projects and interventions must consider all the environmental, functional and aesthetic elements that make up a landscape, as well as the complexity of their interactions:

- a) as characteristics attributed to physical support, both of the soil and the subsoil, its drainage networks, the aquifers and their susceptibilities to anthropic action;
- b) the climatic characteristics of the place and the different forms and possibilities of adaptation of the communities of living beings to these characteristics;
- c) as characteristics of existing ecosystems - their main ways of life and their value in the context of the place and country, in addition to their potential for use, in terms of resources, for human society;
- d) the social and, therefore, cultural values, attributed to the place and its implications for the survival of different forms of social behavior;
- e) the anthropic occupation patterns - both urban rural and their size, dimension, trends and possibilities of expansion and their forms of relationship with physical and existing ecosystems and their forming agents;
- f) the degree of processing of existing environmental structures and the convenience of their transformation to medium and short term, that is, the measurement of the

levels of transformation of the different environmental structures in each area, their potential for use and survival in the face of a process of human use, exploration and occupation. The objective, in this case, is to evaluate the real stock of environmental resources, their levels of productivity and their capacity for absorption and recovery in the face of different forms of exploitation;

g) the characteristics of the component elements of the landscape's morphological structures (whatever the support physical or vegetation), as different forms of human occupation: cities, fields, industries, roads and waters. In this sense, the factor of exceptionality in relation to a given scalar reference must be considered, and the greater the landscape value of this or those, such as a country, a state, a sector or a small segment of the territory. Current cultural patterns, which are extremely variable within society, in space and time, must also be considered. (MACEDO, 1999, p. 13).

For this reason, the valuation of free spaces for public use, such as squares, gardens and urban parks, with green as a structuring element of the landscape, becomes a determining factor for the development of urban design.

To understand how these typologies influence landscape planning, it is assumed that urban green areas can be integrated into the category of free spaces in the city, with characteristics aimed at restoring natural elements, regardless of the size of vegetation (MILANO, 1993). In the same sense, Cavalheiro et al. (1999) state that the green area is "a special type of open space where the fundamental element of composition is vegetation". Under this approach, Lima et al. (1994, p. 549) weave a complementation, in which green area is a category of free space, as long as there is a predominance of tree vegetation, such as "squares, public gardens and urban parks".

In turn, Nucci (2008, p. 120), when discussing the issue, addresses the importance of the functions performed by vegetated spaces when considering that, for an area to be identified as a green area, there must be a "predominance of planted areas and that it must fulfill three functions (aesthetic, ecological and leisure) ", in addition to presenting a vegetal cover and "permeable soil (without slab) that must occupy at least 70% of the area ".

Regardless of its qualification framework, whether public or private green areas, in any of the two categories must present some type of vegetation (not just trees) with a significant vertical dimension, making it relevant that they are used for social, ecological, scientific or cultural purposes (NOGUEIRA; WANTUELFER, 2002).

Therefore, within the scope of this research, the content expressed in the concept is considered a public green area:

[...] all free space (green / leisure area) that has been affected as being in common use and that presents some type of vegetation (spontaneous or planted), that can contribute in environmental terms (photosynthesis, evapotranspiration, shading, permeability, biodiversity conservation and mitigate the effects of noise and air pollution) and which is also used for social, ecological, scientific or cultural purposes. (BENINI, 2009, p. 71).

As these spaces are in common use by the people, it imposes on the municipal administration, as well as the "collectivity (society as a whole), the duty to defend and preserve such spaces (public green areas), since they can contribute to the healthy quality of life and, consequently, for environmental quality "(BENINI, 2009).

The studies carried out by Nucci (2008, p. 109) emphasize the comfort conditions provided by the green areas, where it is common to find a pleasant environment, away from the “anguish” of the city, allowing the individual to interact with nature.

These environments must be pleasant and aesthetic, with varied accommodations and facilities in order to ease individual choice. They must be free from monotony and free from the difficulties of space and the anguish of urban agglomerations. Especially for children it is essential that the free space provides the possibility to experience sounds, smells, textures, taste of nature; walking barefoot on the sand, lawn; have contact with animals such as birds, small mammals and insects, etc. (NUCCI, 2008, p. 109).

Gomes (2005, p. 57) complements Nucci's statement (2008, p. 109), pointing out that green areas, “from the psychological and social point of view, influence the mood of individuals massified with the disorder of large cities”. The author also states that vegetation offers environmental benefits such as, for example, combating air pollution through photosynthesis, “it regulates air humidity and temperature; maintains soil permeability, fertility and moisture and protects it from erosion and; it reduces noise levels serving as a damper for city noise” (GOMES, 2005, p. 57).

In this analytical context, Loboda and Angelis (2005) state that urban green areas contribute to improving the quality of life in cities. According to Gomes (2005), green areas can provide thermal comfort, since these green surfaces interfere with the formation of microclimates.

It should be noted that wooded spaces intercept solar radiation, causing a substantial reduction in soil temperature. This happens because the plant absorbs part of the solar radiation for its metabolism (photosynthesis). In addition, the movement of air between the leaves removes much of the heat absorbed from the sun. Spirn (1995, p. 68-69) explains that green areas differ from the concrete landscape due to their ability to disperse solar radiation, through evaporation and transpiration.

In the city, concrete, stone, brick and asphalt replace the natural vegetation coverage of the countryside. These materials absorb heat more quickly and keep it in greater quantities than plants, soil and water. [...] Throughout the day, the pavement, walls and roofs absorb and conserve the heat of solar radiation. Although water and plants also absorb solar radiation, most of that energy is spent on evaporation and transpiration - resulting in a greater loss of heat than is absorbed. [...] The city cools down more slowly: it has absorbed more heat, and the irradiation of that heat to the night sky is inhibited by the walls of the buildings. (SPIRN, 1995, p. 68-69).

Likewise, Danni-Oliveira (2003, p. 157), based on studies of urban climatology, states that residential areas, when “flanked by green areas”, receive “incidence of solar radiation”, through “exchanges of heat and humidity flows, as well as the dispersion of pollutants”.

In a broader context, the relevance of green areas present in the urban fabric reiterates the need to incorporate the principles of preservation and conservation, from which the concept of urban sustainability emerges. This can favorably interfere not only in improving environmental quality, but mainly in the quality of urban life. However, it should be noted, from the studies developed by Diegues (1996), that the simple presence or implantation of green

areas in cities requires the recognition and valorization of the local population, so that it appropriates their environments when enjoying and contribute to its care and maintenance.

METHODOLOGY

For the delimitation of the universe to be studied, a qualitative research was chosen, in which the procedures had a logical basis that consisted of the investigation divided into three phases: “open or exploratory”, “data collection” and “systematic analysis and interpretation of data”(LÜDKE; ANDRÉ, 1986, p. 21).

The first phase of the research, known as open or exploratory, consisted of examining the literature relevant on the theme, from books, to theses, dissertations, articles, etc. with constant repetition of the same bibliographic references, without presenting new propositions that would expand the theoretical discussion.

The second phase of the research consisted of data collection in loco (carried out in 2019 and tabulation in 2020), with the support of the works of Angelis, Castro and Angelis Neto (2004), Santiago, Santiago and Soares (2016) and NBR 9050/2015, for the definition of the necessary methodological procedures. In this phase, the cartographic database of the Municipality of Cuiabá and the data from IBGE (2010) were used.

The third phase consisted of the insertion of the research object within a framework of theoretical references, concomitantly with the empirical construction, which allowed obtaining the products of this research.

AVPUs EVALUATION PROCEDURES

Once the implementation of AVPUs in the neighborhood was verified, the following requirements were considered for analysis: accessibility, vegetation, quantity and quality of the deployed park furniture and the provision of public services. For the construction of the empirical research, pre-established attributes and variables were considered, as shown below:

- a) to assess the quality of accessibility in AVPUs, the state of conservation of the floor, the existence and dimensioning of circulation routes, natural barriers that could compromise accessibility, the provision of a ramp and a tactile alert and directional floor were considered, as well as the provision of parking, including for the elderly (Table 1):

Table 1 - Allocation of weight (value) to accessibility in AVPU

ATTRIBUTE	VARIABLES	SITUATION	WEIGHT
Accessibility	Conservation status of floor in the space (AVPU)	good	2
		reasonable	1
		bad	0
	Circulation routes are less than 1.20 meters	yes	0
		no	2
	Existence of at least one accessible route within the space (AVPU)	yes	2
		no	0
	The space's vegetation (AVPU) gets in the way of the accessible route	yes	0
		no	2
	Has an access ramp	yes	2
		no	0
	Has tactile warning and directional floor	yes	2
		no	0
	Around the space (AVPU) there are places reserved for people with disabilities	yes	2
		no	0
	Around the square (AVPU) there are places reserved for the elderly	yes	2
no		0	
Parking	yes	2	
	no	0	

- b) the quality of the “vegetation” attribute was measured, considering criteria with the provision of wooded spaces and undergrowth, the landscape treatment, as well as the percentage of permeability in the AVPUs (Chart 2):

Table 2 - Attribution of weight (value) to vegetation in AVPU

ATTRIBUTE	VARIABLES	SITUATION	WEIGHT
Vegetation	The space is wooded	yes	3
		no	0
	The space has undergrowth	yes	3
		no	0
	The space has landscaped treatment	yes	3
		no	0
	Permeability (%)	superior to 75%	3
		from 50 to 75%	2
		from 25 to 49%	1
		inferior to 25%	0

- c) In order to assess the quality of the park furniture intended for recreation, the offer of a playground, exercise equipment (outdoor gym), gym equipment for the elderly was considered, as well as if the AVPUs had the installation of a sports court (Table 3).

Table 3 - Allocation of weight (value) to park furniture intended for recreation in AVPU

ATTRIBUTE	VARIABLES	SITUATION	WEIGHT
Park furniture intended for recreation	playground	yes	3
		no	0
	Exercise Equipment - Outdoor Gym	yes	3
		no	0
	Fitness equipment for seniors	yes	3
		no	0
	Sports court	yes	3
		no	0

- d) among the evaluated attributes, in the cultural matter, the installation of a stage for artistic presentations, fountain and water mirror and exhibition of works of art, such as sculptures, busts, among others, were considered (Table 4):

Table 4 - Allocation of weight (value) to park furniture intended for culture in AVPU

ATTRIBUTE	VARIABLES	SITUATION	WEIGHT
Culture	Stage	yes	2
		no	0
	Works of art	yes	2
		no	0
	Water fountain / water mirror	yes	2
		no	0

- e) the quality of the park furniture in general, considered the value/weight attributed to each variable in Table 5, in order to allow a systematic analysis of the AVPUs:

Table 5 - Allocation of weight (value) to park furniture in general in the AVPU

ATTRIBUTE	VARIABLES	SITUATION	WEIGHT
Mobiliário em geral	Benches	yes	3
		no	0
	Drinking fountain	yes	3
		no	0
	High lighting	yes	3
		no	0
	Low lighting	yes	3
		no	0
	Trash can	yes	3
		no	0
	Restroom	yes	2
		no	0
	Bus stop	yes	1
		no	0
	Taxi stand	yes	1
		no	0
	Newsstand	yes	1
		no	0
	Payphone	yes	1
		no	0
Kiosk	yes	1	
	no	0	

- f) In addition, the research included the evaluation of public services offered in AVPUs, such as space conservation and cleaning. At this stage, the security offer (keeper) on site was also considered (Table 6):

Table 6 - Allocation of weight (value) to the public service offer in AVPU

ATTRIBUTE	VARIABLES	SITUATION	WEIGHT
Public service	Space conservation	good	2
		reasonable	1
		bad	0
	Space cleanliness	good	2
		reasonable	1
		bad	0
	Has security (keeper) on site	yes	1
		no	0

The combination of these attributes presented, considering their variables, allowed the generation of some analysis products, such as tables and maps, which allowed specializing the quality of AVPUs.

From these data, the Urbanized Public Green Area Index (IAVPU) was measured by neighborhood in the west of the city of Cuiabá, through data interpolation in the following formula:

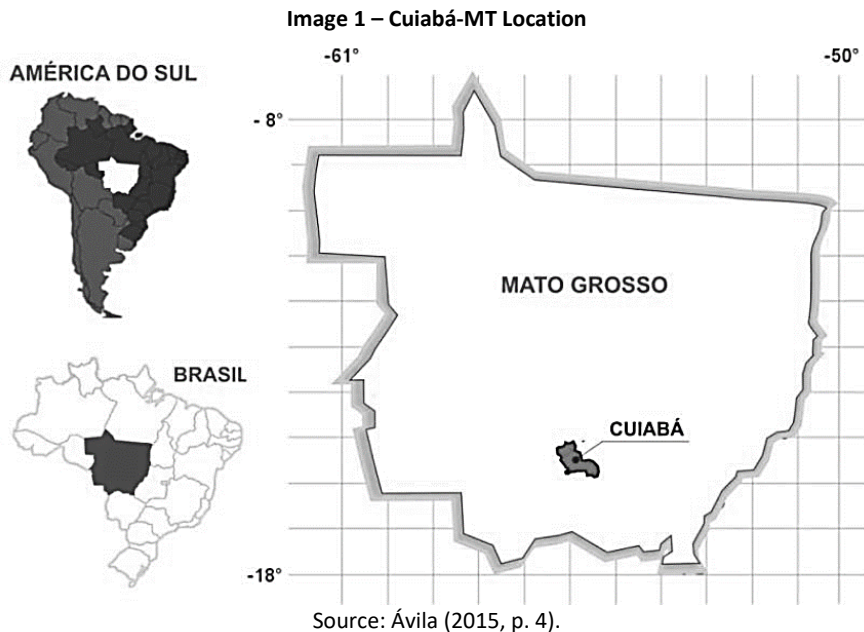
IAVPU = Urbanized Public Green Area Index by neighborhood

$$\sum \{ \text{AVP Urbanized} : \text{population} \} = \text{IAVPU (m}^2/\text{hab)}$$

Thus, considering the presented methodology, it is highlighted that it can be replicated not only in other areas of the city of Cuiabá, but in any city in the Brazilian territory.

CASE STUDY

The city of Cuiabá-MT is located in the geomorphological province called Baixada Cuiabana, between the geographical coordinates 15 ° 35 'and 56' 'south latitude and 56 ° 06' and 01 '' longitude W Greenwich. For the development of this work, the western area of the city Cuiabá, State of Mato Grosso, was chosen as focus of this research, which has an area of 3,538.17 km², corresponding to 254.57 km² the urban area and 3,283.60 km² the rural area . It borders the municipalities of Acorizal, Rosário Oeste, Chapada dos Guimarães, Santo Antônio do Leverger and Várzea Grande (Image 1).



The site has topographic features with slightly wavy reliefs at low altitudes, ranging from 146 to 250 meters, whose main drainage course is the Cuiabá River. According to Ávila (2015, p. 4), in the region there is a predominance of a “continental Tropical climate, without maritime influence, where the interference of urban land use in the occurrence of heat islands has already been detected”, the region “has a low frequency and average wind speed, which

makes the influence of the built space on the air temperature more noticeable, since the thermal exchanges by convection are minimized”, thus there is a predominance of high temperatures, with rain in summer and winter with dry weather.

Currently, the urban area of Cuiabá is formed by 118 neighborhoods, constituted by the four administrative regions: northside, southside, eastside and westside.

According to data from the IBGE Census (2010), 135,635 people live in the west of the city of Cuiabá (Table 1), of this number, 33.87% are in the range of 0 to 19 years old (children and adolescents), which demonstrates the importance of offering public spaces, such as squares, gardens and urban parks, for leisure and recreation.

Table 1 - Population (children and adolescents) in the westside of the city of Cuiabá-MT

Cd.	WESTSIDE NEIGHBORHOOD	POPULATION ⁽¹⁾	AGE GROUPS (%)			
			0 to 4 years	5 to 9 years	10 to 14 years	16 to 19 years
01	Jardim Ubirajara	713	8,56	7,15	10,80	9,82
02	Ribeirão do Lipa	2.087	8,34	6,85	9,20	8,05
03	Novo Colorado	3.172	8,51	10,21	11,10	11,00
04	Jardim Mariana	1.672	7,66	7,36	7,54	7,48
05	Santa Marta	825	5,45	6,18	7,52	8,24
06	Despraiado	7.386	8,41	7,92	8,71	8,25
07	Alvorada	13.035	6,26	6,24	7,31	7,82
08	Do Quilombo	7.574	5,06	5,98	6,72	8,05
09	Duque de Caxias	5.261	6,54	5,11	5,76	7,36
10	Ribeirão da Ponte	2.126	8,28	6,59	8,42	8,61
11	Santa Rosa	1.916	5,22	6,21	6,99	6,42
12	Barra do Pari	6.704	6,89	8,10	8,41	7,97
13	Jardim Santa Isabel	8.213	7,49	7,20	8,73	8,95
14	Cidade Verde	2.392	5,98	6,73	8,07	8,74
15	Cidade Alta	10.244	6,21	6,16	6,78	7,69
16	Jardim Cuiabá	1.392	4,45	4,60	6,39	6,97
17	Da Goiabeira	5.997	5,15	5,47	6,70	7,84
18	Popular	1.597	3,82	3,13	4,88	6,83
19	Centro Norte	2.510	4,94	5,14	4,90	7,33
20	Centro Sul	4.062	4,85	4,78	5,71	7,75
21	Do Porto	9.274	6,26	6,19	6,90	8,55
22	Coophamil	5.525	5,72	6,61	7,35	7,82
23	Novo Terceiro	3.779	7,28	7,86	8,65	8,63
24	Dos Araés	5.556	5,38	5,54	5,98	7,07
117	Urban Expansion Area	-	-	-	-	-

1 - Population according to data collected by the IBGE Census (2010).

Source: IBGE (2010), organized by the author (2020).

As a basis for this article, data from the table “Value of the average monthly nominal income, value of the median monthly nominal income of people with revenue, responsible for permanent private households, according to the neighborhoods” of IBGE (2010) were used, where:

Table 2 - Average income

CLASS	LIMIT
Low income	Lower than 2,91 S.M.
Medium-Low income	From 2,91 S.M. to 5,65 S.M.
Average income	From 5,66 S.M. to 11,65 S.M.
Medium-high income	From 11,66 S.M. to 21,94 S.M.
High income	Above 21,94 S.M.

Fonte: IBGE (2010).

When observing the economic data on the average income of the population in the region, it was found that only the neighborhoods Ribeirão do Lipa and Novo Colorado were classified as low class, which shows special attention to the vulnerability of these residents.

Table 3 - Average income of the population in the westside of the city of Cuiabá-MT

Cd.	WESTSIDE NEIGHBORHOOD	POPULATION ⁽¹⁾	AVERAGE INCOME (SM) ⁽²⁾	CLASS LIMIT
01	Jardim Ubirajara	713	3,83	Medium-Low income
02	Ribeirão do Lipa	2.087	2,86	Low income
03	Novo Colorado	3.172	2,81	Low income
04	Jardim Mariana	1.672	13,46	Medium-high income
05	Santa Marta	825	12,41	Medium-high income
06	Despraiado	7.386	5,80	Average income
07	Alvorada	13.035	13,61	Medium-high income
08	Do Quilombo	7.574	16,96	Medium-high income
09	Duque de Caxias	5.261	17,56	Medium-high income
10	Ribeirão da Ponte	2.126	5,02	Medium-Low income
11	Santa Rosa	1.916	37,51	High income
12	Barra do Pari	6.704	10,47	Average income
13	Jardim Santa Isabel	8.213	3,17	Medium-Low income
14	Cidade Verde	2.392	5,38	Medium-Low income
15	Cidade Alta	10.244	9,44	Average income
16	Jardim Cuiabá	1.392	21,60	Medium-high income
17	Da Goiabeira	5.997	13,69	Medium-high income
18	Popular	1.597	30,75	High income
19	Centro Norte	2.510	21,23	Medium-high income
20	Centro Sul	4.062	12,47	Medium-high income
21	Do Porto	9.274	7,38	Average income
22	Coophamil	5.525	8,58	Average income
23	Novo Terceiro	3.779	3,61	Medium-Low income
24	Dos Araés	5.556	12,79	Medium-high income
117	Urban Expansion Area	-	-	-

1 - Population according to data collected by the IBGE Census (2010); 2 - Average Income (SM) - as a basis for this work, the data in the table "Value of the average monthly nominal income, value of the median monthly nominal income of people with revenue, responsible for permanent private households, according to neighborhoods" of the 2000 Demographic Census (results of the universe), released by IBGE.

Source: IBGE (2010), organized by the author (2020).

RESULTS

During this research, there was a shortage in the supply of AVPUs in the western area of the city of Cuiabá, thus showing a disagreement with the Land Installment Law (Law 6.766 /

1979), which determines in its article 22 which urban equipment (roads and squares, open spaces and areas destined for public buildings and other urban equipment), after the registration of the subdivision, become part of public domain goods.

It is known that Public Administrations have budgetary restrictions to meet all urban demands (health, education, social services, among others), and for this reason an insufficient amount of the budget ends up being allocated for the implementation of these spaces.

Table 4 - Summary of the qualitative assessment of AVPUs in the westside of the city of Cuiabá-MT

Cd.	WESTSIDE NEIGHBORHOOD	URBANIZED PUBLIC GREEN AREA	M ²	QUALITY ⁽¹⁾	AVERAGE Q. ⁽²⁾
3	Novo Colorado	Praça Frei Donato (SQUARE)	1.322	23	
4	Jardim Mariana	Praça Miguel Benedo Maluf (SQUARE)	2.434	39	
6	Despraiado	without denomination	1.100	22	21
		without denomination	1.454,28	24	
		without denomination	556,39	17	
7	Alvorada	Praça Maria Bem-Vinda (SQUARE)	1.260,93	47	
8	Do Quilombo	Praça João Balduino Curvo (SQUARE)	1.300	16	17,8
		Praça Alice de Lima Grisólia (SQUARE)	600	17	
		Praça da Macumba (SQUARE)	50	7	
		Praça Mitsuo Doima (SQUARE)	500	21	
		Praça Santos Dumont (SQUARE)	1.500	28	
9	Duque de Caxias	Parque da Mãe Bonifácio (PARK)	770.000	64	
10	Ribeirão das Pontes	Praça Capitão Antonio João (SQUARE)	2.404	24	
11	Santa Rosa	Praça da Criança (SQUARE)	2.566,71	46	36,2
		Praça Fernando Augusto Cardoso (SQUARE)	2.178,07	47	
		without denomination	715	27	
		without denomination	1.182,65	35	
		Praça Lourice Mansur Bumlai Ayoub	1.507,62	26	
12	Barra do Pari	without denomination	395,33	27	
14	Cidade Verde	Praça Terminal da Cidade Verde (SQUARE)	900	34	36,5
		without denomination	8.394,29	19	
16	Jardim Cuiabá	Praça Manoel Miraglia (SQUARE)	3.712	35	25
		without denomination	590	13	
		without denomination	723	27	
17	Da Goiabeira	Praça Mario Augusto de Pinho (SQUARE)	1.605,6	22	28,25
		Praça Manoel Murtinho (SQUARE)	2.343	27	
		Praça Clóvis Cardoso (SQUARE)	2.531,44	47	
		Praça Falcãozinho (SQUARE)	1.762,57	17	
18	Popular	Praça 8 de Abril (SQUARE)	4.434,86	42	41
		Praça Tenente Antônio João Ribeiro (SQUARE)	888,83	28	
		Praça Presidente Eurico Gaspar Dutra (SQUARE)	3.678,22	53	
19	Centro Norte	Praça Antônio Correia (SQUARE)	4.046,5	29	38,71
		Praça Alencastro (SQUARE)	3.928,68	54	
		Praça da República (SQUARE)	4.318	28	
		Praça Caetano de Albuquerque (SQUARE)	509,94	39	

		Praça Dr. Alberto Novis (SQUARE)	523,63	40	
		Praça Senhor dos Paços (SQUARE)	368,84	36	
		Praça José Rachid Sandy (SQUARE)	2.888,14	45	
20	Centro Sul	Praça Ipiranga (SQUARE)	2.000	40	28,5
		Praça Almirante Barroso (SQUARE)	195	23	
		Praça da Antiga Caixa D'água (SQUARE)	900	32	
		Moreira Cabral	400	19	
21	Do Porto	Praça Luis de Albuquerque (Orla) (SQUARE)	4.606,22	35	23,8
		Praça Major João Bueno (SQUARE)	2.456,33	31	
		Praça Maria Ricci (SQUARE)	2.576,45	39	
		without denomination	466	6	
		Praça Cohab Nova Cuiabá (SQUARE)	2.266,76	8	
22	Coophamil	without denomination	908	21	23,16
		Praça dos Amigos (SQUARE)	908	18	
		Praça Mariana Dutra Ferreira da Silva (SQUARE)	1.521	32	
		Praça Dona Sabina Alves de Campos (SQUARE)	2.456	35	
		without denomination	373	19	
		Praça de Alimentação e Artesanatos (SQUARE)	471	14	
23	Novo Terceiro	Praça da Igreja (SQUARE)	8.184,64	27	
24	Dos Araés	Praça Ermete Ricci (SQUARE)	1.917,43	9	16,66
		Praça Mestre Inácio (SQUARE)	446,9	22	
		Praça Tuffik Affi (SQUARE)	5.036,1	19	

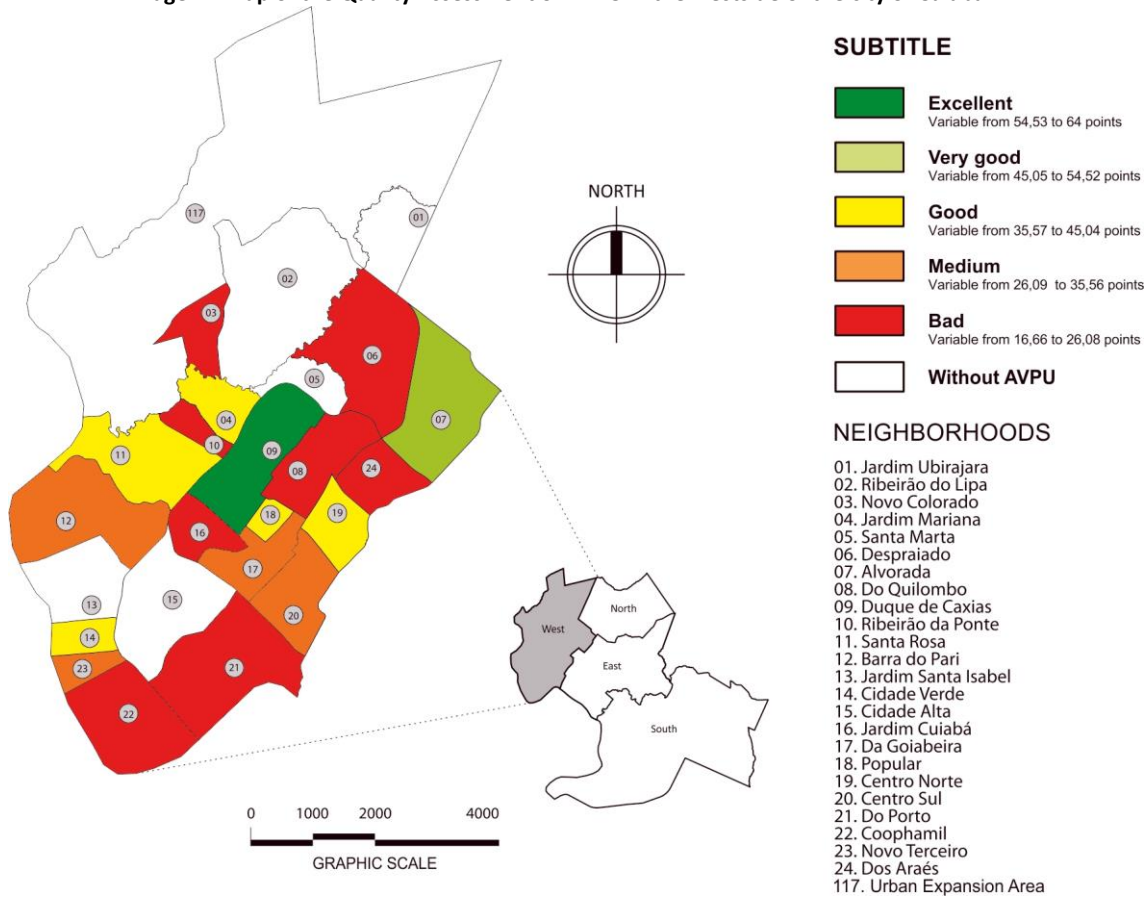
1 - Quality of AVPU - Urbanized Public Green Area (squares, gardens and parks); 2 - Average quality measured by neighborhood.

Source: IBGE (2010), organized by the author (2020).

The results obtained by the qualitative analysis of the AVPUs demonstrated that a significant portion of these spaces shows precariousness in the supply and maintenance of their furniture.

Image 2 shows the contradiction present in the implementation of public policies aimed at leisure and recreation in the region, because where the population has lower income, the quality of AVPUs is low, or, simply, they were not implemented, as in the Ribeirão do Lipa and the Novo Colorado.

Image 2 - Map of the Quality Assessment of AVPU in the westside of the city of Cuiabá-MT



Source: Prepared by the author (2020).

Table 5 shows the Urbanized Green Area Index (IAVP), which is based on the calculation of AVPU availability for each inhabitant in the neighborhood. According to Troppe and Galina (2003), the United Nations (UN) recommends that “12 square meters of green area per inhabitant be adopted so that there is a balance between the amount of oxygen and carbon dioxide”.

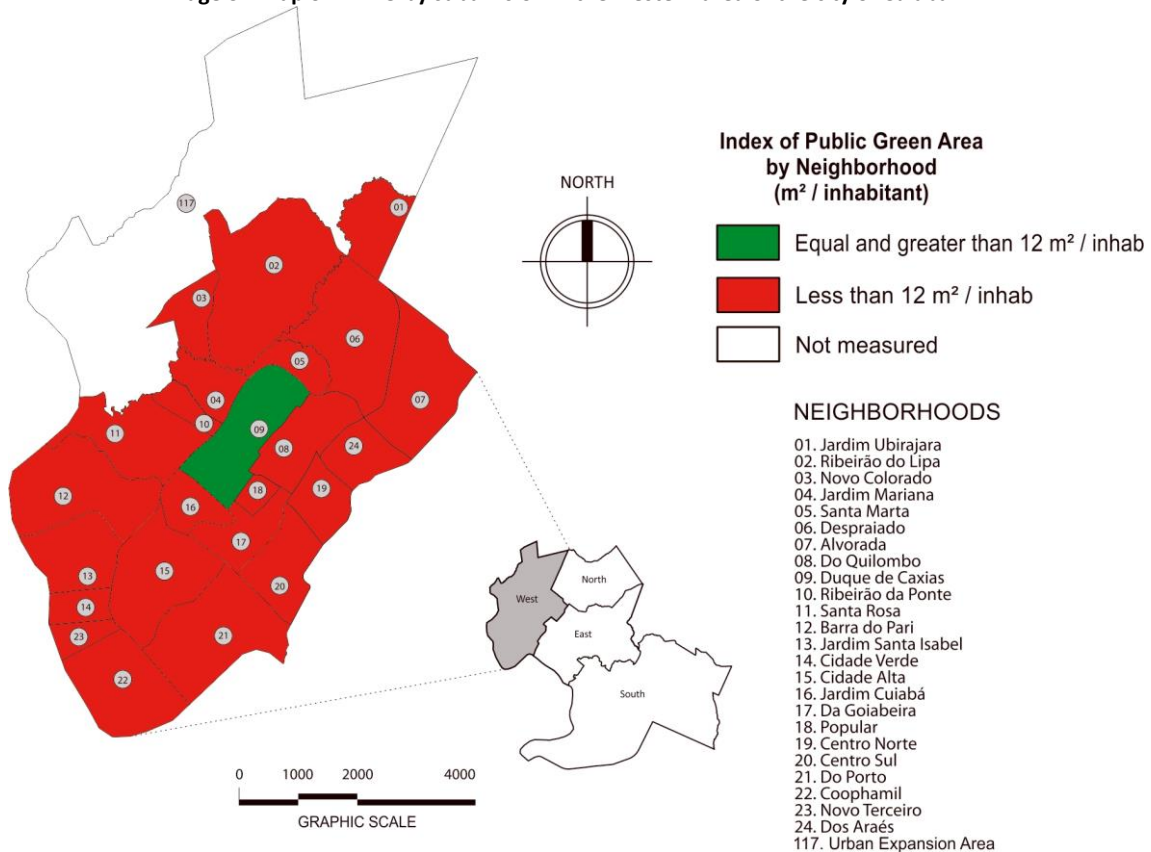
Table 5 - IAVPU in the west of the city of Cuiabá-MT

Cd.	WESTSIDE NEIGHBORHOOD	POPULATION⁽¹⁾	AVPU /M2⁽²⁾	IAVPU⁽³⁾
01	Jardim Ubirajara	713	0	0
02	Ribeirão do Lipa	2.087	0	0
03	Novo Colorado	3.172	1.322	0,41
04	Jardim Mariana	1.672	2.434	1,45
05	Santa Marta	825	0	0
06	Despraiado	7.386	3.110,67	0,42
07	Alvorada	13.035	1.260,93	0,09
08	Do Quilombo	7.574	4.750	0,62
09	Duque de Caxias	5.261	77.0000	146,36
10	Ribeirão da Ponte	2.126	2404	1,13
11	Santa Rosa	1.916	8.150,05	4,25
12	Barra do Pari	6.704	395,33	0,25
13	Jardim Santa Isabel	8.213	0	0
14	Cidade Verde	2.392	9.294,29	3,88
15	Cidade Alta	10.244	0	0
16	Jardim Cuiabá	1.392	3.747	2,69
17	Da Goiabeira	5.997	8.242,61	1,37
18	Popular	1.597	9.001,91	5,36
19	Centro Norte	2.510	4.075,5	1,62
20	Centro Sul	4.062	3.495	0,86
21	Do Porto	9.274	12.371,76	1,33
22	Coophamil	5.525	6637	1,22
23	Novo Terceiro	3.779	8184	2,16
24	Dos Araés	5.556	7.400,43	1,33
117	Urban Expansion Area	-	-	-

1 - Population according to data collected by the IBGE Census (2010); 2 - AVPU / M2 - Urbanized Public Green Area per square meter; 3 - IAVPU - Urbanized Public Green Area Index.

Source: Prepared by the author (2020).

Image 3 - Map of IAVPU by subdivision in the western area of the city of Cuiabá-MT



Source: Prepared by the author (2020).

The spatialization of the IAVPU in the westside of Cuiabá in Image 3 shows that, despite the predominance of high temperatures in the region, which would require the provision of more green areas. Most of the studied area has an index below the ideal recommended by the UN, with the exception of the Duque de Caxias neighborhood, where the Parque da Mãe Bonifácio is located.

CONCLUSION

The content presented in this article shows that the westside of the city of Cuiabá presents a lack not only in the quantity of public spaces destined for leisure and recreation, but also in the quality of these spaces, which denotes the absence of public policies directed to the population in general.

When measuring the IAVPU, it was found that there is a need to implement new spaces, in compliance with the Soil Installment Law. In this sense, the importance of implementing urban parks is highlighted so that the index of 12m² of green areas per inhabitant can be reached, in order to contribute to improving the environmental quality of the population.

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