Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 09, número 70, 2021

Guarapiranga And Burle Marx Parks: Perception And Use By Regulars, São Paulo City, Brazil

Edmilson Nazareno Brito
M.Sc. in Environmental Management and Sustainability – Nove de Julho University (UNINOVE).
edbiocl@gmail.com

Ana Paula Branco do Nascimento
Ph.D. in Applied Ecology (ESALQ/CENA/USP). Department of Civil Engineering, São Judas Tadeu University
ana.branco@saojudas.br

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 09, número 70, 2021

SUMMARY

Studies on the population's perception towards urban green areas can contribute to the management of these spaces. This study analyzed the perception and use of two urban parks by their regulars. The regulars' individual characteristics were identified and categorized according to the activities taking place in the parks, in order to characterize the uses that the population makes of these spaces. The data survey was accomplished by means of 103 interviews in each park, following a structured guideline that allowed the quantitative analysis of the data thus obtained. These parks are perceived and used for providing social and environmental functions, besides leisure and health benefits, thus contributing to the quality of life. The basic infrastructure, such as toilets and drinking fountains, and physical exercise facilities, such as multisport courts, playgrounds and hiking trails, are perceived as important for the social life of regulars of various age groups.

KEYWORDS: Urban Green Areas; Environmental Perception; Use of Parks.

1. INTRODUCTION

The Earth's landscape has been modified in order to attend the necessities of the human kind (HARARI, 2015). As a great ecosystem engineer (ADLER and TANNER, 2015), the Homo sapiens has been constantly modifying the environment. Many forests have been put down, levees have been built along rivers, plains have been flooded, kilometers of highways have been built, and metropoli full of skyscrapers have been created to shelter seven billion humans. Thus, our green and blue planet has been turned into concrete and plastic (HARARI, 2015).

There is a growing concern regarding environmental issues, such as global warming, sea level rise and dissemination of pollution, among others that affect the quality of life of the urban population. Such concerns have already been pointed out in various world conferences on the environment organized by the United Nations Organization, such as the one that took place in Rio de Janeiro in 1992 – the ECO-92. However, it is in the first decade of the 21st century that the majority of the planet's inhabitants have lived in cities (ADLER and TANNER, 2015), which has increased the concern about urban ecosystems.

The urban environment is the most modified on Earth. The more urbanization spreads out, the more fragmented the natural environment becomes (GODDARD *et al*., 2010). According to Adler and Tanner (2015), urban habitats are divided into four categories: built (edifications and paved areas), residue-disposal (human waste), green-area (covered by plants) and aquatic (covered by water) habitats. These environments show how the urban areas are designed and built for human use, reflecting in a lower diversity of plants and animals and resulting in a poorer quality of life for the population (MAAS *et al*., 2006).

The majority of the international organizations are worried about the conservation of ecosystems, but give little importance to smaller urban green areas that exist close to where people live and work. However, there is a perception among people residing in large urban centers that these areas contribute to the quality of life in many ways (CHIESURA, 2004; COLE *et al*., 2019). Besides a variety of ecosystem services, these areas, including urban parks, offer important psychological benefits to the mental health, enriching life with meanings and emotions (CHIESURA, 2004; JIM and CHEN, 2006; WANG *et al*., 2019).

The large urban center inhabitants search for green areas for several reasons, among others: leisure, contact with nature, meditation, fitness and sports (DORIGO and LAMANO-

FERREIRA, 2015). It is important that the population acknowledge these areas, because this is a paramount factor for its conservation (Viana et al., 2014). For Dorigo and Lamano-Ferreira (2015) the urban green areas assume an important role in the improvement of the environment and in the offering of spaces for leisure and recreation, besides contributing to urban sustainability.

Several actions have been developed to avoid the decrease of green spaces caused by urbanization in São Paulo city. An example is the "Programa 100 Parques para São Paulo" ("100 Parks for São Paulo" Program), launched in 2008 by the Municipal Green and Environment Secretariat of São Paulo (SMVA). However, many of the parks created up to that year do not offer benefits such as shaded areas, good quality of life, among others. In order to assess the contribution of urban parks, this study analyzed the perception of the regulars of two urban parks in São Paulo city, identifying the factors related to the choice and use of these green spaces.

1.1 Urban Green Areas

The fast economic and social changes in the world have brought great expansion, redefinition and re-structuring of the cities, some of these transformations have damaged the environment. These changes have arisen the necessity to improve the environmental quality in the cities (JIM & CHEN, 2006). According to Sanesi and Chiarello (2016), the urban green areas potentialize the quality of life and the citizens see the public and private green areas as beneficial to the city.

The quality of life in the city is directly linked to various factors that are encompassed in the infrastructure and in the economic-social development and to those related to environmental issues (LOBOTA and DE ANGELIS, 2009). For Chiesura (2004), the public green areas are essential to the population's well-being, because they have a direct influence in their physical and mental health. According to Loboda and De Angelis (2009), the quest for a better quality of life in the cities has been materialized as actions such as the building of public squares and parks in urban centers, aiming at the improvement of the quality of life, recreation, environmental preservation, preservation of water resources, and sociability itself.

To Costa and Colesanti (2011), these green areas can help raise the population's awareness to their conservation, because they provide a positive relationship between population and the environment. The urban parks belong to fragments of an ecosystem, composed of natural and artificial elements, including trees, grass, shrubs and flowers (LI *et al*., 2005).

Natural environments located among built areas offer environmental benefits, such as the contact with nature and leisure (DORIGO and LAMANO-FERREIRA, 2015). These spaces promote improvements in the quality of life in the cities by means of systems composed of green areas and leisure facilities (COSTA and COLESANTI, 2011). However, Cole et al. (2019) conclude that the benefits provided by green spaces are not egalitarian, that is, they may not be well distributed in the city, benefiting part of its inhabitants. Consequently, another part of the population is not contemplated with the advantages of these areas.

Urban parks are important places both for quality of life and conservation of green areas in the cities (CHIESURA, 2004; LI *et al*., 2005). These spaces can contribute to the formation

of citizens with more conscious attitudes and behavior towards the environment (Viana et al., 2014). According to Gomes (2003), green areas have little by little conquered the Brazilian urban space, both as a consequence of the monotony of the cities and the environmental necessities that are a consequence of urban expansion and problems derived from it.

According to Kim and Jin (2018), urban parks are positively associated with the well-being of the citizens, benefiting all ages, in particular the elderly. The authors highlight their disposition to pay some sort of tax so that more parks are created in Seul. A study of Wang et al. (2019) carried out in California suggests that the benefits provided by green spaces to mental health can be extended to teenagers.

At present, the valorization of these spaces by the population has stood out. The creation and implementation of parks require the understanding of the necessities of socially distinct groups, which take possession in different ways of existing public equipment in the urban perimeter (GOMES, 2003). It is worth mentioning that administrators should take into consideration the distribution of these spaces in the big cities.

1.2 Environmental Use e Perception

According to Tuan (2012) and generally speaking, environmental perception is a response of the senses to external stimuli and maintains a relationship with the individual socio-cultural context. The individual can have positive or negative attitudes regarding the landscape. Environmental perception is related to the sensations and interactions established between the human being and the environment during his life experience. The perception takes place in a distinct and particular way, because it is linked to each individual's previous experience, sensory responses, memory and culture.

Environmental perception has been studied by various areas of knowledge that try to explain which processes and how people develop certain attitudes and behavior in relation to the environment they belong to (COSTA; COLESANTI, 2011).

Studies such as those developed by Bi et al. (2010) in Wujin in China demonstrate the relationship between socio-economic factors and the environmental perception of the communities that regard environmental issues as severe, especially in relation to air and water pollution. Besides, many believe that it is important to classify environmental problems that are related to other social and economic issues, and that environmental protection must be defined as a priority.

According to Dorigo and Lamano-Ferreira (2015), studies regarding environmental perception of green areas, such as public squares and parks in great urban centers, serve as tools for public administration. Administrators can involve regulars in the management strategies devised for these green areas. The study of environmental perception leads to a more efficient management of these spaces, because it allows the formulation and implementation of managing strategies that effectively comply with the desires and necessities of the public who visit such places (RÉGIS, 2016).

In this sense, the study of the Conquista Municipal Park in São Paulo city carried out by Régis et al. (2016) involved interviews and the collection of quantitative and qualitative data that allowed the surveying of the regulars' profiles and their perception and use of the park. The

evaluation made by the regulars on the services offered by the park and its infrastructure is relevant for the shaping of public policies, such as the planning of socio-educational activities.

To learn about the human perception and the use of urban parks is fundamental to a proper apprehension of the role played by urban green spaces in the quality of life. This corroborates to the betterment of these areas and the consequent improvement of human health. The exposition to biodiversity is related to the improvement of health and well-being (Sandifer et al. 2015).

2. OBJECTIVE

The objective of the study is to evaluate the environmental perception of two municipal parks and the use of urban parks in the city of São Paulo: identify the environmental profile of frequenting parks both (Gurarapiranga and Burle Marx) and compare the environmental perception and use of the Guarapiranga Park (public administration) and Burle Marx (private administration).

3. METHODS

3.1 Study Areas

The urban parks selected for this study are the Guarapiranga Park (PG) and the Burle Marx Park (PBM), both located in São Paulo city and designed by the team of the landscape architect Roberto Burle Marx. These parks are inserted in the *Mata Atlântica* (Atlantic Forest) Biome, considered a world biodiversity hotspot, once it presents a wide diversity of endemic species. It is the most degraded biome in Brazil. The Guarapiranga Park (PG) and the Burle Marx Park (PBM) were opened to the public in 1974 and in 1995 respectively. The region surrounding PG is an environmental protection area. This Park is located close to the Guarapiranga dam built in 1908 for the generation of electric power. In 1928, the Guarapiranga dam became one of the main water reservoirs for public supply in São Paulo. It totalizes 152.600 m^2 of area. The PG flora consists of planted eucalyptus interspersed with natural *Mata Atlântica* woods and exotic species. The PG fauna is very rich, including 49 bird species, 40 butterfly types, the teiú lizard (*lagarto teiú*), possums (*gambás*) and the batfish (*ratão do banhado*) (PMSP, 2015).

The Burle Marx Park is located on the margins of the Pinheiros River and the *Nações Unidas* Avenue. It was incorporated to the public patrimony by compulsory donation for the opening of the Panamby real estate development. The area of the Burle Marx Park was negotiated and licensed for 25 years (Bartalini, 1999). It is a municipal park managed by the *Organização da Sociedade Civil de Interesse Público* (OSCIP – Civil Society Organization of Public Interest) named Aron Birmann Foundation (FAB). By the end of the 1940's, the entrepreneur Francisco Matarazzo Pignatari, known as Baby Pignatari, invited the landscape architect Roberto Burle Marx to project the gardens of his mansion designed by Oscar Niemeyer. Remnant of the *Chácara Tangará*, the area was donated to the prefecture and two stripes of native forest were incorporated to it by the State of São Paulo in 1994 (PMSP, 2015).

The Master Plan of the Burle Marx Park defines it as a contemplative leisure park on the basis that the majority of its area is constituted by *Mata Atlântica* in its second recovery phase. There are no spaces designed for the practice of sports or court games and bicycling and

skating are forbidden by the PBM regulation. Pets, such as dogs and cats, are not allowed in the park either. The main sporting activity in PBM is walking and jogging along tracks opened in the *Mata Atlântica* (FAB, 2016). The PBM infrastructure includes a Cooper and hiking trail, a track for walking in the woods, fitness equipment (bars and boards), playground, parking place, toilets, a natural orchidarium, springs, lakes, water mirrors, and a snack bar.

3.2 Data Collection and Analysis

The character of this research is exploratory and a qualitative approach is adopted for better familiarity between the researcher and the theme of the research, once it is little known and explored (VERGARA, 2012). The data were obtained using a research form divided in two parts: the first part contained closed questions with the objective of characterizing the regulars' socio-economic profile and their perception of the park. The second part contained 27 statements concerning urban parks and was used to categorize the regulars' environmental perception and use of the parks.

Two ways of data collection were adopted: direct observation and interviews with closed questions. There were periodic visits to both parks in alternate opening hours and different days of the week, holidays and events promoted by the administration of both parks. After the visits, the information was recorded in field diaries by the researcher. The observation was structured with pre-defined objectives (VERGARA, 2012).

As mentioned before, the interviews were recorded in a research form divided in two parts. The first part helped collect data that were used in the comparative and quantitative analysis of the infrastructure of both parks. This part also contained variables that allowed characterize the profile of the interviewed regulars (Chart 1). A five-point Likert scale was used for the answers. When answering the chart using this scale, the regulars specified their level of concordance with a grade varying from 1 to 5 (Hair et al, 2005).

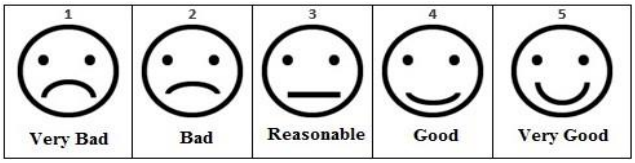
In the second part of the research form (Chart 2), 27 tested and validated statements were used for surveying the environmental perception and use of urban parks. A Likert scale from 0 to 10 was adopted, in which 0 means "totally disagree" and 10 "totally agree".

The interviewed people were randomly chosen by following a simple random sampling method that attributes to each element of the target population, in this case the regulars, the same probability of being interviewed (Hair et al. 2005). The data obtained in each set of interviews were identified using the capital letter G for the Guarapiranga Park and B for the Burle Marx Park and numbers in time sequence. The data were recorded in Microsoft Excel (2013) worksheets.

The analysis of the data was performed using the factorial method of component extraction because, according to Figueiredo and Silva (2010), this method enables the researcher to reduce the variables to a smaller number of factors. The use of softwares such as the Statistical Package for the Social Sciences (SPSS) for the analysis of qualitative data is justified because it allows a more organized and rigorous treatment of a large volume of empirical material contained in the research forms. The Conbach alfa test was also applied, resulting in the reliability coefficient for each factor. According to Hair et al. (2005), the scale for such coefficient varies from 0 to 1, being the acceptable values representing the reliability of the research greater than 0.7.

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 09, número 70, 2021

Chart 1: List of questions of the first part of the research form that was used to characterize the socio-environmental profile of the interviewed regulars of the Guarapiranga and Burle Marx Municipal Parks.

Sections	Objectives	Questions
Socio-environmental profile	Characterize the regulars' socio-environmental profile	1. Age 3. Schooling 4. Gender (M) (F) 5. Marital status 6. Children (Y) (N) How many? 7. How many people live in your house (including you)? 8. How many times per week do you come to the park? 9. Do you usually come alone or with somebody (who)? 10. Period you come to the park 11. Is the access to the park easy? (Y) (N) Why?
Perception of the infrastructure	Identify how the interviewed regulars perceive the Guarapiranga and Burle Marx Parks regarding infrastructure, equipment and facilities	**A** – A list of statements on the characteristics of the park is found below. Please, write the number that corresponds to the emoji that best describes your perception towards the statement. 1. The quality of the green areas of the park is 2. The infrastructure available in the park is 3. The quality of the toilets of the park is 4. The availability of drinking fountains in the park is 5. The quality of toys (playground) of the park is 6. The availability of benches in the park is 7. The availability of fitness equipment is 8. The quality of the jogging track in the park is 9. The availability of parking places in the park is 10. The security in the park is 

Source: Adapted from Régis (2016)

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 09, número 70, 2021

Chart 2: List of statements of the research form used to characterize the environmental perception and the use of the parks by the interviewed regulars.

Please choose the answer that best reflects your opinion in relation to each of the following statements. There is no right or wrong answer – we just want to know your opinion.	Consider the following scale: 0 – Totally disagree 10 – Totally agree										
1. I like to picnic in the park.	0	1	2	3	4	5	6	7	8	9	10
2. The park should offer accessibility to visitors of reduced mobility, such as elderly people, pregnant women and disabled people.	0	1	2	3	4	5	6	7	8	9	10
3. Ecological tracks are important so that regulars can know the park better.	0	1	2	3	4	5	6	7	8	9	10
4. The park is a safe place for regulars.	0	1	2	3	4	5	6	7	8	9	10
5. When I am in the park I usually use the drinking fountains.	0	1	2	3	4	5	6	7	8	9	10
6. When I am in the park I usually use the toilets.	0	1	2	3	4	5	6	7	8	9	10
7. I throw litter in the waste baskets around the park.	0	1	2	3	4	5	6	7	8	9	10
8. I use the fitness equipment installed in the park.	0	1	2	3	4	5	6	7	8	9	10
9. I use the playground of the park.	0	1	2	3	4	5	6	7	8	9	10
10. I usually rest on the benches of the park.	0	1	2	3	4	5	6	7	8	9	10
11. Parks are important to the preservation of animal life.	0	1	2	3	4	5	6	7	8	9	10
12. Parks are important to the preservation of plants.	0	1	2	3	4	5	6	7	8	9	10
13. Parks contribute to reduce air pollution.	0	1	2	3	4	5	6	7	8	9	10
14. Parks contribute to reduce urban noise.	0	1	2	3	4	5	6	7	8	9	10
15. I regain the contact with nature by visiting parks.	0	1	2	3	4	5	6	7	8	9	10
16. Parks contribute to the preservation of springs.	0	1	2	3	4	5	6	7	8	9	10
17. The vegetation of the park reduces the heat sensation.	0	1	2	3	4	5	6	7	8	9	10
18. Parks contribute to environmental education.	0	1	2	3	4	5	6	7	8	9	10
19. Parks contribute to social life.	0	1	2	3	4	5	6	7	8	9	10
20. I usually talk to people in the parks.	0	1	2	3	4	5	6	7	8	9	10
21. The prefecture is responsible for the care of the park.	0	1	2	3	4	5	6	7	8	9	10
22. The population is responsible for the care of the park.	0	1	2	3	4	5	6	7	8	9	10
23. Parks are proper places for leisure.	0	1	2	3	4	5	6	7	8	9	10
24. Parks are places that contribute to a better quality of life.	0	1	2	3	4	5	6	7	8	9	10
25. Parks are proper places for children.	0	1	2	3	4	5	6	7	8	9	10
26. Parks are proper places for teenagers.	0	1	2	3	4	5	6	7	8	9	10
27. Parks are places for adult social life.	0	1	2	3	4	5	6	7	8	9	10

Source: Adapted from Régis (2016)

4. RESULTS AND DISCUSSION

4.1 . Characterization of the Regulars' Profiles

Table 1 was compiled with the data obtained from 206 interviews. The majority of the PBM (50.48%) and the PG (39.80%) regulars are older than 40 years of age. Regarding schooling, the majority of the PBM regulars (65.05%) are Higher Education students or graduates, whereas the majority of the PG regulars (51.46%) attend or finished High School. Regarding the marital status, half of the regulars of both parks are married. The majority of the PBM couples (63.11%) have children, whereas 71.84% of the PG couples are childless. Regarding the socio-environmental profile, it is observed that the majority of the regulars of both parks (more than 60%) live in residences with a maximum of three people, followed by four to six people (33%).

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 09, número 70, 2021

Table 1: Characterization of the socio-environmental profile of the interviewed regulars of the Burle Marx and Guarapiranga Parks, from October to December 2016.

VARIABLES	BURLE MARX		GUARAPIRANGA	
	n= 103	100.00%	n=103	100.00%
AGE GROUP				
from 18 to 29	22	21.36%	29	28.16%
from 30 to 39	29	28.16%	33	32.04%
40 and older	52	50.48%	41	39.80%
EDUCATION				
Fundamental (complete or incomplete)	7	6.80%	17	16.50%
High School (complete or incomplete)	29	28.16%	53	51.46%
Higher Education (complete or incomplete)	67	65.05%	33	32.04%
MARITAL STATUS				
single	51	49.51%	54	52.42%
married	52	50.48%	49	47.57%
CHILDREN				
Yes	65	63.11%	29	28.16%
No	38	36.89%	74	71.84%
NUMBER OF PEOPLE LIVING IN THE SAME RESIDENCE				
one to three	65	63.11%	66	64.08%
for to six	35	33.98%	34	33.01%
seven and more	3	2.91%	3	2.91%
ATTENDANCE				
once to three times a week	35	33.98%	15	14.56%
from Mondays to Fridays	2	1.94%	2	1.94%
only on weekends	66	64.08%	86	83.50%
COMPANY				
alone	24	23.30%	21	20.39%
accompanied	79	76.70%	82	79.61%
PERIOD				
morning	67	65.05%	56	54.37%
afternoon	36	34.95%	47	45.63%
EASY ACCESS				
Yes	83	80.58%	96	93.20%
No	20	19.42%	7	6.80%
TYPE OF TRANSPORTATION				
on foot	43	41.75%	60	58.20%
car	45	43.69%	19	18.45%
public transport	11	10.68%	24	23.30%
bicycle	4	3.88%	0	0.00%

Source. Prepared by the authors from the collected data

The majority of the interviewed regulars visit the parks on weekends (PG: 64.1%; PBM: 83.5%), in the morning (PB: 65.0%; PBM: 54.37%), and accompanied (PG: 76.7%; PBM: 79.6%). Some regulars go to the parks alone (PB: 23.3%; PBM: 20.3%), once to three times a week (PG: 33.9%; PBM: 14.56%), and prefer the afternoons (PG: 34.95%; PBM: 45.63%).

The regulars of both parks consider that the access to the parks is easy (PB: 80.58%; PBM: 93.20%). The majority of the PBM regulars go to the park by car (43.69%), followed by those who go on foot (41.75%); by public transport (10.68%), and by bicycle (3.88%). The majority of the PG regulars go to the park on foot (58.20%), followed by those who go by car (18.45%) and public transport (23.30%).

The quality of the green areas (Figure 1A) was considered good (58.3%) by the majority of the PG regulars and very good (55%) by the PBM regulars. It is worth mentioning that there are extensive forested areas in both parks with rich fauna and flora, but the vegetation in PG

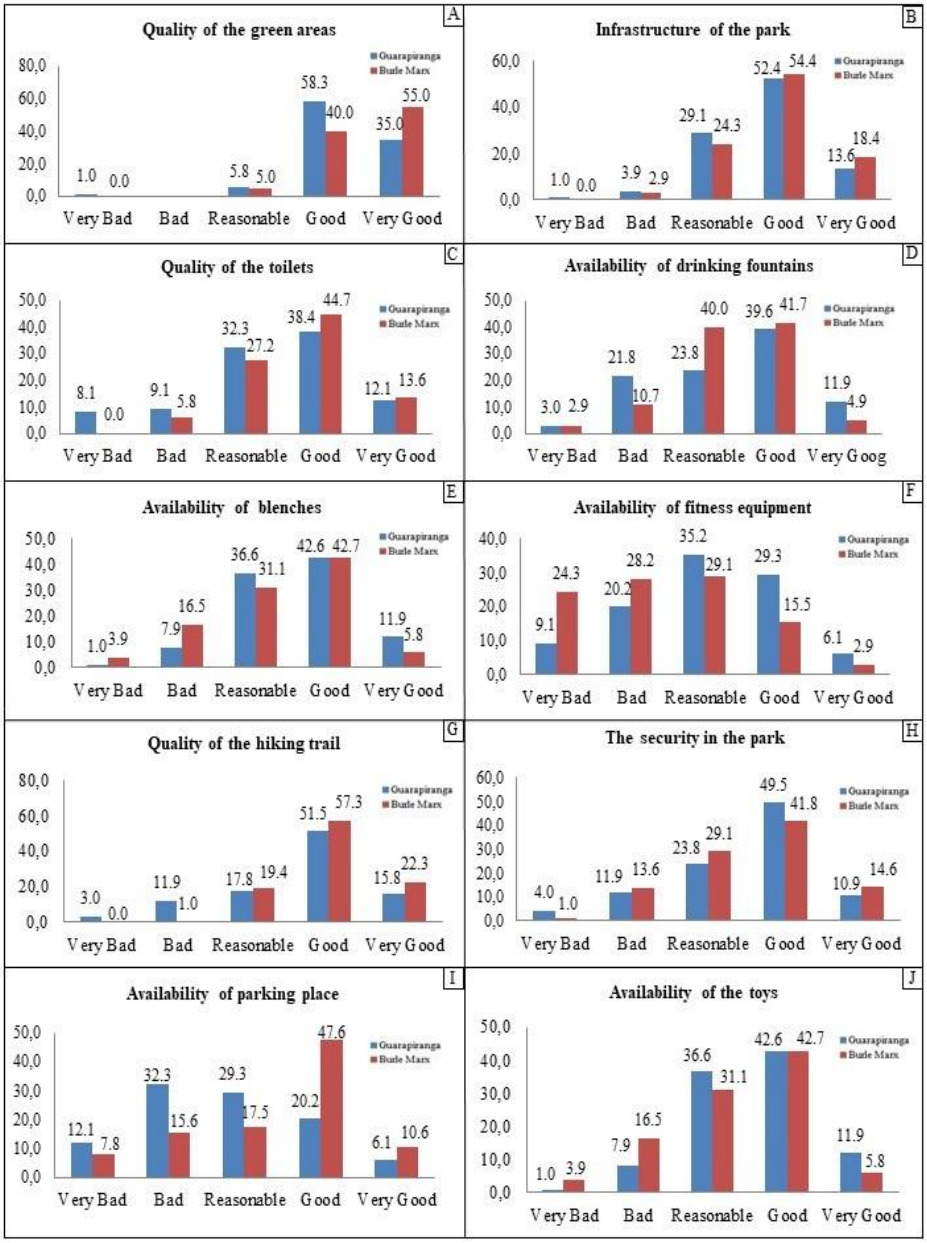
has been modified with the planting of a large number of exogenous tree species such as eucalyptus, European pines and coffee trees. On the other hand, the native forested area in PBM is more preserved. As mentioned before, PBM originated from a farm that belonged to Baby Pignatari, who preserved the native trees with the assistance of the landscape architect Burle Marx (the park was later named in his honor). The harmonious aspect of the PBM landscape architecture is appreciated by its regulars. Therefore, the contemplation of the PBM green area is one of the activities of its regulars.

The infrastructure of both parks (Figure 1B) is considered good (PG: 52.4%; PBM: 54.4%); the quality of the toilets (Figure 1C): good (PG: 38.4%; PBM: 44.7%); availability of drinking fountains (Figure 1D): good (PG: 39.6%; PBM: 41.7%), and availability of benches (Figure 1E): good (PG: 42.6%; PBM: 42.7%). The quality of the hiking trail (Figure 1G), the security in the park (Figure 1H) and quality of the toys in the playgrounds (Figure 1J) were also considered good by the majority of the regulars of both parks (PG: 51.5%; PBM: 57.3%; PG: 49.5%; PBM: 41.8%; PG: 42.6%; PBM: 42.7%, consecutively). The availability of fitness equipment (Figure 1F) was considered reasonable by the regulars (PG: 35.4%; PBM: 29.1%). Regarding the parking place (Figure 1I), 47.6% of the PBM regulars rank it as good, once it is paid in this park. For the PG regulars, availability/offer of parking places in PG is bad (32.3%).

PG originated from an expropriation and was the first park designed by the Department of Parks and Green areas of São Paulo City with the aid of a restricted budget granted by various departments. Part of the PG area was reforested with eucalyptus (Bartalini, 1999). It is possible to infer from the PG regulars' answers that the activities in PG are more diversified than in PBM.

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 09, número 70, 2021

Figure 1: Qualitative-quantitative analysis of the infrastructure of the Burle Marx (PBM) and Guarapiranga (PG) parks according to their regulars' perception (n=206). In A: Quality of the green areas; B: Infrastructure of the park; C: Quality of the toilets; D: Availability of drinking fountains; E: Availability of benches; F: Availability of fitness equipment; G: Quality of the hiking trail; H: Security in the park; I: Availability of parking places; and J: Quality of the toys (playground).



Source: Prepared by the authors.

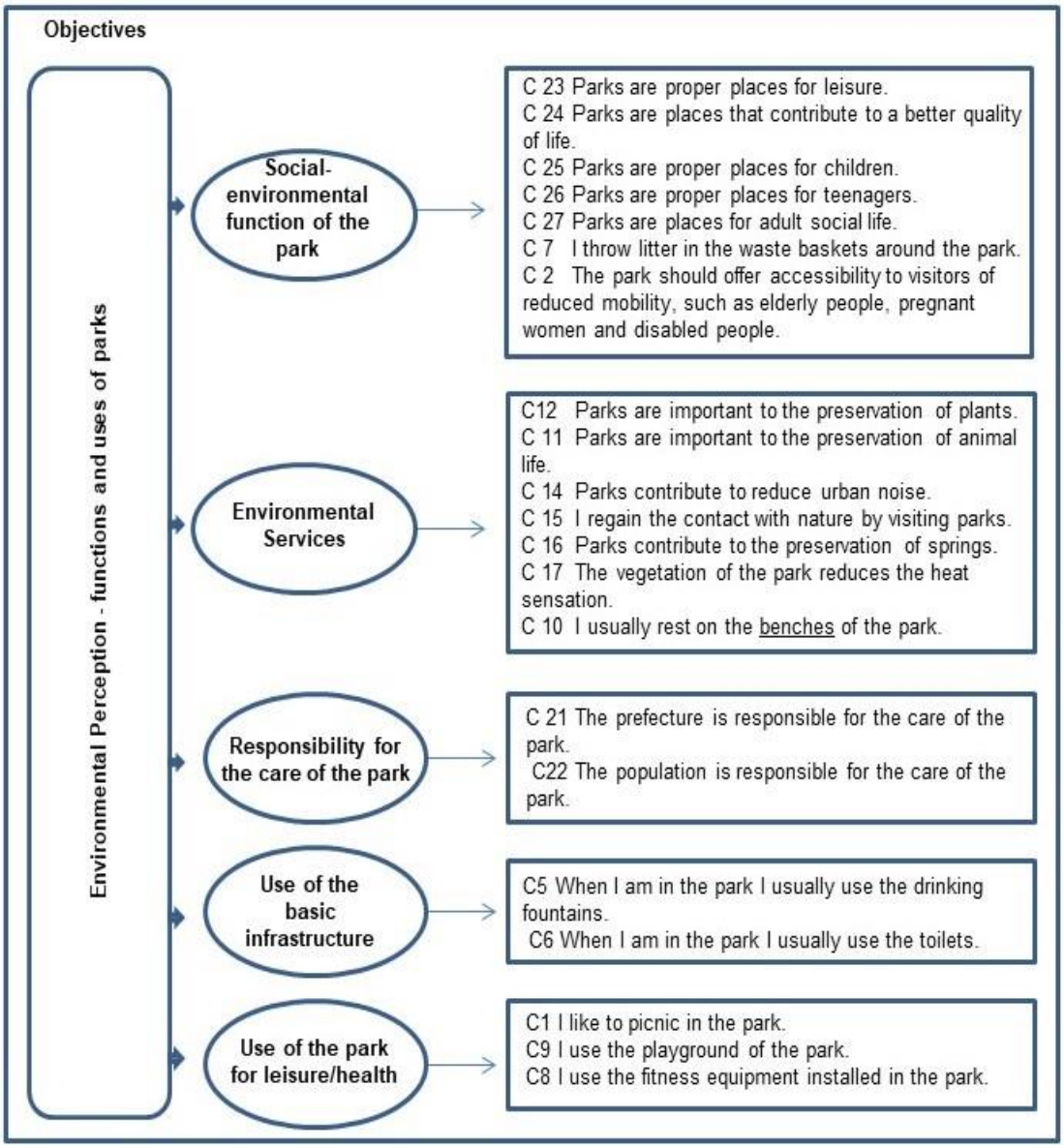
4.2 Perception on the function and use of the parks

The factorial analysis of the 27 statements was performed via the software SPSS, resulting in four factors with acceptable reliability coefficients (Hair et al., 2005). After the application of the factorial analysis, 20 variables remained from the 27 items analyzed. The statements were grouped into four factors, which allowed the analysis of how PBM and PG were

perceived by their regulars (Figure 2). Among the factors, the following are listed: socio-environmental function, responsibility for the care of the park, use of the basic infrastructure and use of the park for leisure and health benefits.

The variables concerning the factor "*social and environmental function of the parks*" are related to the contribution of the parks to the preservation of plants and springs, contact with nature and social life. This factor also shows that the urban parks are perceived by their regulars as proper places for all ages, contributing to a better quality of life and leisure. The perception of the 206 interviewed regulars converges towards the scientific contributions to parks (GAIKWARD and SHINDE, 2019; SANDIFER *et al*., 2015). According to the authors, the use of parks facilitates the social participation at various levels, leading to health benefits.

Figure 2*:* Factors formed from the synthesis of the variables used to identify how the interviewed PG and PBM regulars perceive and use the urban parks.



Source: Prepared by the authors.

Another factor identified in the analysis was the "*use of parks for leisure and health*", once the facilities are related to physical activities, including playground for children and picnic. This factor in the regulars' perception involves interaction both with the family and friends. Other studies show that urban parks greatly contribute in this sense by offering to physical, mental and social benefits both to the elderly (GAIKWARD and SHINDE, 2019) and adolescents (WANG *et al.,* 2019). It is worth stressing out that the aging of the population is growing, being discussed as global phenomenon. In a country like Brazil and mainly in São Paulo city with 106 urban parks, the investment in the maintenance of green areas should be a priority and more parks like PG and PBM must be studied.

Table 2: Mean values, in a scale from 0 to 10, per variable and per factor, resulting from the factorial analysis.

FACTORS	MEAN PBM	MEAN PG
1 Social and environmental function of the parks	**9.47**	**9.34**
C24. Parks are places that contribute to a better quality of life.	9.74	9.54
C12. Parks are important to the preservation of plants.	9.74	9.58
C15. I regain the contact with nature by visiting parks.	9.67	9.39
C17. The vegetation of the parks reduces the heat sensation.	9.47	9.34
C18. Parks contribute to environmental education.	9.00	9.34
C14. Parks contribute to reduce urban noise.	8.96	9.15
C16. Parks contribute to the preservation of springs.	8.74	8.97
C19. Parks contribute to social life.	8.88	8.84
C2. The parks should offer accessibility to visitors of reduced mobility, such as elderly people, pregnant women and disabled people.	9.54	9.03
C23. Parks are proper places for leisure.	9.61	9.54
C25. Parks are proper places for children.	9.61	9.63
C27. Parks are places for adult social life.	9.01	9.38
C11. Parks are important to the preservation of animal life.	8.81	9.31
2 Use of parks for leisure and health benefits	**5.72**	**6.80**
C1. I like to picnic in the park.	5.04	5.65
C8. I use the fitness equipment installed in the park.	5.72	7.17
C9. I use the playground of the park.	6.80	6.80
3 Use of the basic infrastructure	**7.29**	**7.09**
C5. When I am in the park I usually use the drinking fountains.	6.80	6.80
C6. When I am in the park I usually use the toilets.	7.79	7.38
4 Responsibility for the care of the park	**8.47**	**8.27**
C21. The prefecture is responsible for the care of the park.	8.08	7.99
C22. The population is responsible for the care of the park.	8.86	8.55

Source: Prepared by the authors.

Differences and similarities between the parks

Table 2 presents the mean values of the marks given by the interviewed regulars for each of the analyzed variables for both PBM and PG. The reliability coefficient was calculated for each factor (Conbach alfa) and, following Hair (2015), this coefficient ascertained the coherence among the interviewed regulars' answers. Each of the components indicates the importance that the regulars give to the group of variables it encompasses. Thus, the socio-environmental function, which yielded mean values of 9.34 (PG) and 9.47 (PBM) in a scale from 0 to 10, was the most valued by the interviewed regulars. The second most valued factor was the "*responsibility for the care of the park*". The mean values obtained for PG and PBM regarding this factor were 8.27 and 8.47 respectively. The third most important factor was the "*basic infrastructure*" of the park with mean values of 7.09 (PG) and 729 (PBM). The "*use of structures*

for leisure/health" was the fourth most valued factor by the regulars, with mean values of 6.80 for PG and 5.72 for PBM.

The order of importance of the factors was the same for both parks, although considerable differences are observed, when the mean values of each factor are compared. Thus, regarding the social and environmental function of the parks, the mean value for PG is 0.13 more than that for PBM. This difference is not relevant, because it is relatively small. However, it is worth stressing out other differences between the variables indicated for the parks that are embedded in this factor.

For PBM, the variable C2, which deals with parks offering accessibility to visitors of reduced mobility, such as elderly people, pregnant women and disabled people, yielded a mean value of 9.54, whereas for PG the mean value was 9.03. We can infer that the PBM regulars are more concerned about the park offering specific facilities for people who need special treatment or that the PBM regulars have identified this necessity in PBM. Obstacles were detected during our visits to both parks regarding facilities for people with difficulties of locomotion. For example, in PG the terrain is steep and the hiking trail is paved with cobblestone, which impairs the locomotion of people in wheelchairs. Because the floor is irregular and smooth, especially when it rains, the number of accidents is bound to increase, which is preoccupying when it comes to pregnant women and the elderly. In PBM there is accessibility for people in wheelchairs and part of the trail is covered with cement and is regular, but in both PBM and PG no alert signs are displayed. There are no signs indicating the best routes for disabled people. The toilets are inadequate for them and there are no ramps for people in wheelchairs in various places to be visited in the parks.

Regarding variable C11, which deals with the importance of parks for the preservation of animals, the mean value for PBM was 8.81, whereas for PG it was 9.31. This implies in a difference of 0.5, which denotes that the PG regulars rely more on this function than PBM regulars. In several interviews, the PBM regulars mentioned the prohibition of pets, such as dogs and cats, stated in the PBM regulation: some were against and some were in favor, which could be the main reason for the difference observed in this item.

Another variable of the first factor that yielded a considerable difference was C27, which quantifies the regulars' perception of the park as a place for adult social life. For PBM the mean value for this item was 9.01 and for PG 9.38, that is, a difference of 0.37. In this regard, PG is better equipped with multisport courts, playgrounds, community centers, fitness equipment, and barbecue facilities. Some activities observed in PBM are for a restricted forum, such as birthday parties or events for a pre-selected public.

A significant difference is also seen regarding variable C16, which indicates that the PG regulars are more confident when it comes to the preservation of springs. Springs are visible in both parks, but the proximity of the Guarapiranga dam to PG generated more, sometimes conflicting, discussions. Despite of the lake, PBM is close to the Pinheiros river, whose polluted waters receive the discharge of waste and sewage.

A difference is also seen in the variable C15, which involves regaining the contact with nature by visiting parks. This can be explained by the fact that the function of PBM is more towards contemplative leisure, as its spaces and structures were designed for this function so that it is expected that people give more importance to the contact with nature. In PG, the

recreation in the playgrounds, the use of the courts and barbecue facilities can be added to this function.

Regarding factor 2 "*use of parks for leisure and health benefits*", the difference between the mean values for PBM and PG is 1.08. It is the greatest difference among the factors analyzed here. It can be the result of the fact that PG regulars gave higher marks for variables C1 and C8. They represent, respectively, the activities picnic and physical exercises. The differences for these variables were 0.59 and 1.45 respectively. It can be inferred that the types of use of the parks interfere in these differences. In PG the equipment for sports and leisure are varied and are used for playing games and sport. Barbecue facilities and kiosks promote picnics and lunches. In PBM, however, these practices are forbidden by its regulation.

The mean value for the factor *"basic infrastructure of the park"* was 7.29 for PBM and 7.09 for PG. The difference is 0.2, the higher mean value being obtained for PBM. This difference results strictly from variable C6. For PBM the mean value is 7.79, whereas for PG it is 7.38. This demonstrates that in PBM the regulars use the toilets more than the regulars in PG. The use of basic equipment depends on the amount of time people spend in the park and they value these facilities, which is what happens in PBM. These results reinforce the fact that these are perceived by the population as contributions to a better quality of life. According to Li (2005), the parks contribute to the supply of ecosystem services, such as improvement of personal health and comfort, leisure and formation of an environmental microclimate of quality.

Regarding factor 4, "*responsibility for the care of parks"*, the difference between the mean values for PBM and PG is 0.2. This results from the fact that the PBM regulars, more than the PG regulars, consider that the responsibility for the care of the park is of the population. This is evident when the difference concerning variable C22 is analyzed (Table 2). The disparity between the mean values for this variable is 0.31, the mean value being higher for PBM, because it is a public park managed by a private administration and the presence of actions or agents from the prefecture is little perceived by its regulars.

5. FINAL CONSIDERATIONS

The results indicate that the Guarapiranga and Burle Marx parks are valued by their regulars. These parks are perceived and used because they promote social and environmental activities, besides leisure and health benefits, contributing to the quality of life. Basic infrastructure (toilets and drinking fountains) and equipment such as kiosks, barbecue facilities, hiking trails, multisport courts and playgrounds are perceived as important for the social life of regulars of various age groups, that is, there are spaces designed for children (playgrounds), adults (trails) and the elderly.

Improvements are suggested for both parks, such as accessibility for disabled people. One of the controversial points regarding PG is the opening of the access to the Guarapiranga dam: some regulars think it contributes to leisure, others think it would cause turmoil in the park. The controversial point regarding PBM is the presence of pets in the park: a group advocates the modification of the regulation that prohibits the circulation of pets, whereas other groups are against it.

The contribution of the *Centro de Convivência e Cooperativa* (CECCO – Coexistence and Cooperative Center) of the Municipal Secretariat for Health, the *Bosque da Leitura* (Forest for

Reading) of the Municipal Secretariat for Culture, multisport courts, kiosks, and barbecue facilities in the Guarapiranga Park is in the sense that the park promotes differentiated activities that provide various functions to the park. The main attractions in the Burle Marx Park are contemplative hiking and ride.

The Guarapiranga and Burle Marx parks totalize *ca.* 300.000 m^2, which represents a large green area located in a region of increasing population density, therefore gaining both ecologic and social importance. The pressure of the population for housing in the Guarapiranga Park and the action of the real estate development group in the Burle Marx Park are intense, and the proper maintenance of these parks and the creation of others is crucial for the sustainable development of the surrounding regions.

More studies are suggested in order to know the regulars' perception and how their involvement can help in the management of such green areas.

REFERÊNCIAS

ADLER, F. R., & TANNER, C. J. (2015). **Ecossistemas Urbanos, princípios ecológicos para o ambiente construído.** São Paulo; Oficina de textos.

BARTALINI, V. (1999). **Parques públicos municipais de São Paulo: a ação da municipalidade no provimento de áreas verdes de recreação** (Doctoral dissertation, Universidade de São Paulo).

CHIESURA, A. (2004). **The role of urban parks for the sustainable city.Landscape and urban planning,** 68(1), 129-138.

DORIGO, T. A., & LAMANO-FERREIRA, A. P. N. (2015). **Contribuições da Percepção Ambiental de Frequentadores Sobre Praças e Parques no Brasil** (2009-2013): Revisão Bibliográfica. Revista de Gestão Ambiental e Sustentabilidade-GeAS, 4(3), 31-45.

HARARI, Yuval Noah. **Sapiens. De Animais a Deuses. História Breve da Humanidade**. Amadora: Elsinore, 20/20 Editora, 2017b

GODDARD, M. A., DOUGILL, A. J., & BENTON, T. G. (2010). **Scaling up from gardens: biodiversity conservation in urban environments**. Trends in Ecology & Evolution, 25(2), 90-98.

GOMES, M. A. S., & SOARES, B. R. (2003). **A vegetação nos centros urbanos: considerações sobre os espaços verdes em cidades médias brasileiras**.Estudos Geográficos, 1(1), 29-39.

JIM, C. Y., & CHEN, W. Y. (2006). **Perception and attitude of residents toward urban green spaces in Guangzhou** (China). Environmental management, 38(3), 338-349.

LI, F., WANG, R., PAULUSSEN, J., & LIU, X. (2005). **Comprehensive concept planning of urban greening based on ecological principles: a case study in Beijing, China**. Landscape and urban planning, 72(4), 325-336.

RÉGIS, M. M. (2016a). **Percepção ambiental e uso de parques urbanos por frequentadores do parque jardim da conquista, São Paulo/SP**. (Dissertação Mestrado, Universidade Nove de Julho.

SILVA, A. (2012). **Percepção Ambiental De Frequentadores E Estudo Dos Impactos Do Parque Ecológico Laguna da Jansen, Município De São Luís, MA**. In Congresso Brasileiro de Gestão Ambiental (Vol. 3).

TERAMUSSI, T. M. (2008). **Percepção ambiental de estudantes sobre o Parque Ecológico do Tietê, São Paulo-SP** (Doctoral dissertation, Universidade de São Paulo

TUAN, Yi-Fu. (2012). **Topofilia: um estudo da percepção, atitudes e valores do meio ambiente.** Tradução: Lívia de Oliveira. ISBN 978-85-7216-627-0. Londrina: Eduel.

VIANA, Á. L., LOPES, M. C., NETO, N. F. D. A. L., KUDO, S. A., da Silva Guimarães, D. F., & MARI, M. L. G. (2014). **Análise da percepção ambiental sobre os parques urbanos da cidade de Manaus, Amazonas.** Revista Monografias Ambientais, 13(5), 4044-4062.