



The Socio-environmental Importance of the Urban Green Park in the Gama Administrative Region - Federal District, Brazil

Erida Machado Barbosa de Pina

Mestra em Meio Ambiente e Desenvolvimento Regional
Universidade do Oeste Paulista, Brasil
erida.mb@gmail.com
<https://orcid.org/0009-0001-0012-6370>

Jacqueline Roberta Tamashiro

Professora Doutora, Universidade do Oeste Paulista,
Universidade do Oeste Paulista, Brasil
arquiteta.jtamashiro@hotmail.com
<https://orcid.org/0000-0001-5607-6555>

Angela Kinoshita

Professor Doutor, Universidade do Oeste Paulista
Universidade do Oeste Paulista, Brasil
angela@unoeste.br
<https://orcid.org/0000-0002-5057-1667>

Submitted: April 28, 2025

Accepted: February 6, 2026

PINA, Érida Machado Barbosa; TAMASHIRO, Jacqueline Roberta; KINOSHITA, Angela. A importância Socioambiental do Parque Verde Urbano na Região Administrativa do Gama - Distrito Federal, Brasil. **Periódico Eletrônico Fórum Ambiental da Alta Paulista**, [S. l.], v. 22, n. 1, p. e2520, 2026. DOI: [10.17271/1980082722120265612](https://doi.org/10.17271/1980082722120265612). Available at: https://publicacoes.amigosdanatureza.org.br/index.php/forum_ambiental/article/view/5612.

Creative Commons Attribution (CC BY 4.0) License. <https://creativecommons.org/licenses/by/4.0/>

A importância Socioambiental do Parque Verde Urbano na Região Administrativa do Gama - Distrito Federal, Brasil

RESUMO

Objetivo - As funções socioambientais do Parque Ecológico do Gama, no Distrito Federal, e sua contribuição para a qualidade de vida da população local, foi a razão do objeto de estudo.

Metodologia - De caráter quantitativo, este trabalho utilizou o método de observação sistemática com o auxílio do aplicativo SOPARC para registrar o perfil dos usuários e os níveis de atividade física praticados em diferentes pontos do parque.

Originalidade/relevância - Este parque urbano situa-se em uma região com escassez de áreas verdes e as formas de sua utilização preenchem uma lacuna na literatura sobre o tema.

Resultados - A pesquisa revelou que a maioria dos frequentadores do parque são adultos (56,35%), seguidos por adolescentes (28,37%), idosos (13,54%) e crianças (1,73%). Houve predominância do público masculino (73,13%) em relação ao feminino (26,87). A maioria dos adultos (40%) se dedicou a atividades físicas vigorosas, enquanto (59%) realizaram atividades moderadas. Os resultados revelaram um uso desigual do parque, com concentração de frequentadores em áreas esportivas e baixa frequência de crianças, idosos e mulheres em outros espaços. A pesquisa também identificou uma variação sazonal na frequência de uso, com maior número de visitantes nos meses de seca.

Contribuições teóricas/metodológicas - As contribuições teóricas e metodológicas do estudo incluem a aplicação do método SOPARC em um contexto específico e a análise da relação entre o uso do parque e o perfil dos frequentadores.

Contribuições sociais e ambientais - Em termos sociais e ambientais, a pesquisa destaca a importância do Parque Ecológico do Gama como espaço de lazer, prática de esportes, contato com a natureza e promoção da saúde, reforçando a necessidade de ações que promovam um uso mais inclusivo e diversificado do parque.

PALAVRAS-CHAVE: Parque urbano. Área verde. Gestão urbana.

The Socioenvironmental significance of the Urban Green Park in the Gama Administrative Region - Federal District, Brazil

2

ABSTRACT

Objective - The socio-environmental functions of the Gama Ecological Park, in the Federal District, and its contribution to the quality of life of the local population were the reasons for the object of study.

Methodology - With a quantitative nature, this work used the systematic observation method with the help of the SOPARC application to record the profile of users and the levels of physical activity practiced at different points in the park.

Originality/Relevance - This urban park is located in a region with a shortage of green areas, and the ways in which it is used fill a gap in the literature on the topic.

Results - The research revealed that the majority of park visitors are adults (56.35%), followed by teenagers (28.37%), seniors (13.54%), and children (1.73%). There was a predominance of the male audience (73.13%) compared to the female audience (26.87). Most adults (40%) engaged in vigorous physical activities, while (59%) performed moderate activities. The results revealed an uneven use of the park, with a concentration of visitors in sports areas and a low frequency of children, the elderly, and women in other spaces. The research also identified a seasonal variation in the frequency of use, with a greater number of visitors in the dry months.

Theoretical/Methodological Contributions - The theoretical and methodological contributions of the study include the application of the SOPARC method in a specific context and the analysis of the relationship between park use and the profile of visitors.

Social and Environmental Contributions - In social and environmental terms, the research highlights the importance of the Gama Ecological Park as a space for leisure, sports practice, contact with nature, and health promotion, reinforcing the need for actions that promote a more inclusive and diversified use of the park.

KEYWORDS: Urban park. Green area. Urban management.

La importancia Socioambiental del Parque Verde Urbano en La Región Administrativa de Gama - Distrito Federal, Brasil

RESUMEN

Objetivo - Las funciones socioambientales del Parque Ecológico de Gama, en el Distrito Federal, y su contribución a la calidad de vida de la población local, fueron la razón del objeto de estudio.

Metodología - De carácter cuantitativo, este trabajo utilizó el método de observación sistemática con la ayuda de la aplicación SOPARC para registrar el perfil de los usuarios y los niveles de actividad física practicados en diferentes puntos del parque.

Originalidad/Relevancia - Este parque urbano se sitúa en una región con escasez de áreas verdes y las formas de su utilización llenan un vacío en la literatura sobre el tema.

Resultados - La investigación reveló que la mayoría de los usuarios del parque son adultos (56,35%), seguidos por adolescentes (28,37%), ancianos (13,54%) y niños (1,73%). Hubo predominio del público masculino (73,13%) en relación al femenino (26,87%). La mayoría de los adultos (40%) se dedicó a actividades físicas vigorosas, mientras que (59%) realizaron actividades moderadas. Los resultados revelaron un uso desigual del parque, con concentración de usuarios en áreas deportivas y baja frecuencia de niños, ancianos y mujeres en otros espacios. La investigación también identificó una variación estacional en la frecuencia de uso, con mayor número de visitantes en los meses de sequía.

Contribuciones Teóricas/Metodológicas - Las contribuciones teóricas y metodológicas del estudio incluyen la aplicación del método SOPARC en un contexto específico y el análisis de la relación entre el uso del parque y el perfil de los usuarios.

Contribuciones Sociales y Ambientales - En términos sociales y ambientales, la investigación destaca la importancia del Parque Ecológico de Gama como espacio de ocio, práctica de deportes, contacto con la naturaleza y promoción de la salud, reforzando la necesidad de acciones que promuevan un uso más inclusivo y diversificado del parque.

PALABRAS CLAVE: Parque urbano. Área verde. Gestión urbana.

1 INTRODUCTION

The accelerated growth of medium-sized cities in recent decades has motivated studies related to management, planning, and territorial organization. In order to achieve sustainable growth, reconciling urban growth and economic development, remote sensing has been a great ally in the challenge of planning and organizing urban space and its surroundings, providing technical support for decision-making by planners and managers (Rufino *et al.*, 2021).

In this context, urban expansion in medium-sized Brazilian cities has frequently resulted in the loss of green areas, which exacerbates the need for urban parks such as the Gama Ecological Park. Pessot (2021) mentions that experiences of visiting protected areas such as parks have the potential to provide moments of leisure amidst nature, learning about natural heritage, thus contributing to its effective appropriation and appreciation, in addition to boosting local economies and increasing financial resources for the maintenance of these areas. Barbosa; Pimentel; Bilar (2020) emphasizes that the "view of urban landscapes" is different for each person, given that they have diverse life experiences and perspectives, and that perceiving implies becoming aware of being part of and caring for the environment to which I belong or in which I am inserted and interact.

In the Gama Administrative Region (DF), the Gama Ecological Park stands out as a concrete example of the importance of green areas for the community and the environment. The park shelters vital ecosystems, such as mound fields, buriti palm groves, and endangered species. In addition to its environmental importance, it offers recreational infrastructure, such as sports courts and some children's play areas, partially meeting the needs of the local population (Government of the Federal District, IBRAM, 2024). According to the Brazilian Institute of the Environment (IBAMA), the park covers 51.49 hectares, being one of the few areas in the Gama Administrative Region dedicated to leisure and outdoor sports. The preservation of its natural characteristics, as well as its diffuse springs and native plants, is crucial for maintaining the ecological balance of the region.

The presence of green spaces, such as the Gama Ecological Park, not only promotes environmental benefits but also has a direct impact on the health and quality of life of the population. Studies show that proximity to nature reduces stress levels, improves the perception of well-being, and even decreases mortality (Derose *et al.*, 2021). In addition, Cunha and Rodrigues (2022), in a study of parks in some Brazilian cities, showed that the presence of urban parks is directly related to physical, environmental, spiritual, and social well-being.

The presence of green spaces, such as the Gama Ecological Park, not only promotes environmental benefits but also has a direct impact on the health and quality of life of the population. Studies show that proximity to nature reduces stress levels, improves the perception of well-being, and even decreases mortality (Derose *et al.*, 2021). In addition, Cunha and Rodrigues (2022), in a study of parks in some Brazilian cities, showed that the presence of urban parks is directly related to physical, environmental, spiritual, and social well-being.

Thus, the main objective of this study was to identify and analyze the social functions of the Gama Ecological Park, evaluating its use by the community and the social, environmental, quality of life, and economic impacts resulting from its existence. Data were collected to analyze the frequency and patterns of use of the Park, identifying seasonal and sociodemographic

factors that influence the occupation of the space; the dynamics of integration of the Park with the local community, identifying barriers and opportunities to promote a more inclusive and diversified use.

2 METHODOLOGY

The research used a combined methodological approach, integrating bibliographic research, field data collection, and quantitative analysis. This triangulation of methods aims to build a solid theoretical framework and deepen the understanding of the social functions of the Gama Ecological Park (DF), recognizing both its objective reality and the community's perceptions of the space.

Data collection was based on systematic observation, using the SOPARC application (Mckenzie, 2006) online (NHLBI, 2024) through the website <https://sites.rand.org/park-counter/>, with the central objective of investigating the social functions of the Gama Ecological Park, with an emphasis on identifying its frequenting public and analyzing how the Park is used by the community. The application allows the quantification of park users, categorizing them by age group (child, adolescent, adult, and elderly) and level of physical activity (sedentary, moderate, and vigorous). The evaluation is momentary, counting the number and type of users, with multiple evaluations and observations.

The observations were carried out at strategic points in the park, such as the jogging track, the soccer fields, the multi-sports court, and the playground, over six months, from October 2023 to March 2024, on alternate days and in the morning. During each 30-minute observation, data were recorded on the number of users present at each point, classified by age group, gender, and the level of physical activity in which they were engaged. Despite the use of quantitative instruments, the observation has a personal character, through the researcher's understanding, description, and interpretation throughout the data collection period. The observation areas comprise specific points in the park, they are not very extensive, but 30 minutes of observation were sufficient to understand the social functions, the target audience, and how the point is used.

As a reference, we have the Statute of Children and Adolescents, Law 8.069, of July 1990, in article 2 (Brazil, 1990), which considers children to be individuals up to 12 years of age, adolescents between 12 and 18 years of age, and elderly people from 60 years of age onwards. Knowing this, in the research, we had a parameter for observation. The use of SOPARC (Mckenzie, 2006) reinforces the methodological rigor of the research, guaranteeing the collection of reliable data comparable with other studies, contributing to the construction of solid knowledge about the social functions of the Gama Ecological Park. Although SOPARC is a widely used tool to assess physical activity in parks, Jogdande and Bandyopadhyay (2022) highlight that its significant use has not yet been fully proven; however, it offers the possibility of providing more reliable information about physical activity and its correlation in outdoor recreation areas.

2.1 Target points of the object of study

The choice of observation points in the Gama Ecological Park was strategic, prioritizing locations with infrastructure that favored community and social interaction, such as the jogging

track, soccer fields, and multi-sports court. Although the park offers other areas of interest, such as an Aeromodelling Track, a sand court, and springs, the research focused on the points with the highest concentration of people, seeking to identify usage patterns and the profile of visitors. This methodological choice allowed for a more efficient and representative data collection, optimizing the time and resources of the research.

The observation areas comprise specific points in the park, are not very extensive, and the observation time was sufficient to understand the social functions, the audience, and how the place is used. The six target points of the research are indicated in Figure 1.

Figura 1-Distribuição dos pontos de observação no Parque Ecológico do Gama



Caption: 1- Start of the jogging track, 2- Soccer field with artificial turf, 3- Sports court, 4- Dirt soccer field, 5- Playground and community meeting point, 6- Soccer field with artificial turf
 Source: Site GEOPORTAL-DF(Governo do Distrito Federal, 2024)

Based on the distribution of observation points illustrated in Figure 1, which presents the map created from the GeoPortal (Distrito Federal, 2024), the next step consisted of deepening the analysis, using statistical techniques to interpret usage patterns, user profiles, and the most practiced activities. In parallel, informal interactions with park visitors complemented this quantitative analysis, revealing their motivations, perceptions, and experiences in the space, allowing for a richer and more complete understanding of the park's social functions and the community's needs.

2.2 Data collection

Data were collected over six months, totaling 72 days of observation. During this period, 30-minute observations were conducted on alternate days, always in the morning, at each of the six strategic points within the park. During the observations, the researcher remained discreet, without directly interacting with the park visitors, but systematically recording their activities and characteristics in the SOPARC application (MCKENZIE, 2006). Table 1 shows the schedule of observations carried out.

Table 1- Schedule of field observations in the Gama Ecological Park

Months/year	Quantity in days
October/2023	12
November/2023	12
December/2023	12
January/2024	12
February/2024	12
March/2024	12

Source: Prepared by the author (2024)

The research focused on understanding the profile of visitors to the Gama Ecological Park and the most frequently observed activity, as shown in Table 2.

Table 2- Variables and classifications assigned in observations

Collection point	Age range of users	Sex	Activity intensity
1	Child	Masculine	Vigorous
2	Teen	Feminine	Moderate
3	Adult		Sedentary
4	Senior		
5			
6			

Source: Prepared by the author (2024).

Based on the collection and compilation of this data, it was important to discuss the integration of the park with the community and to highlight the positive or negative aspects of the place, for the leisure and health of the population. On some occasions, visitors approached the researcher to ask about the study, which provided opportunities for informal dialogues and the collection of impressions about the park. These interactions, although not systematized, provided valuable information about the community's perception of the space, complementing the quantitative data obtained through structured observation. In addition, the research seeks to foster dialogue and community participation in the management of the park, strengthening the bond between the population and this important natural and cultural heritage of Gama.

The method used to differentiate users was the classification of the level of physical activity according to the guidelines of the World Health Organization, WHO (2021), which highlights: VIGOROUS physical activities are those that require a great deal of physical effort and that make you breathe much harder than normal. MODERATE physical activities are those that require some physical effort and make you breathe a little harder than normal, while SEDENTARY individuals would be those who do not exercise and do not visit the park regularly.

3 RESULTS AND DISCUSSION

The ongoing practices observed at the Gama Ecological Park reveal the customs of a society present in sporting, cultural, educational, and contemplative activities.

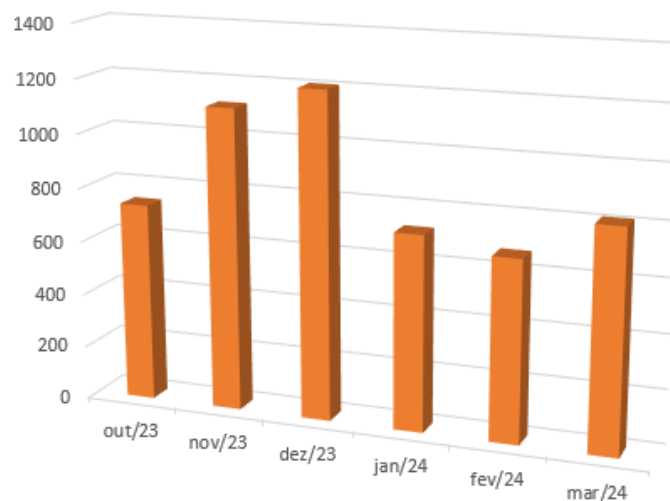
In order to verify the visitor profile, we observed, although the observation is not daily, that several visitors are from neighborhoods relatively close to the park, as they arrive at the park even without a car, walking, or pushing strollers and other means, such as bicycles. It is noteworthy that the park serves both the nearby population and other sectors, as sports classes are offered on site. The research sought to analyze the use of the Gama Ecological Park, and the

results obtained reveal an interesting scenario about the community's relationship with this space. The analysis of user frequency showed that the park is mostly used by adults, especially men, who mainly dedicate themselves to vigorous physical activities, such as soccer. This predominance suggests that the park satisfactorily serves this segment of the population, offering infrastructure and activities appropriate to their needs.

However, the research also revealed a low frequency of children, adolescents, and women in the park. This finding points to the need to expand the range of activities offered and adapt the infrastructure to meet the demands of these groups, promoting greater inclusion and diversity in the use of the space. Furthermore, the analysis of usage frequency throughout the months revealed significant fluctuation, with peaks in December and drops in January and February. This variation may be related to climatic factors, school holidays, and specific events, indicating the importance of considering seasonality in the management and planning of activities in the park.

Graph 1, shows a peak in visitors in December, with 1,205 visitors, followed by a sharp drop in January and February, with 722 and 671 visitors, respectively. From March onwards, there is a gradual increase in the number of users, reaching 815 in March 2024, totaling 5,266 users throughout the survey.

Graph 1 - Number of visitors to the park during the six-month period from October 2023 to March 2024

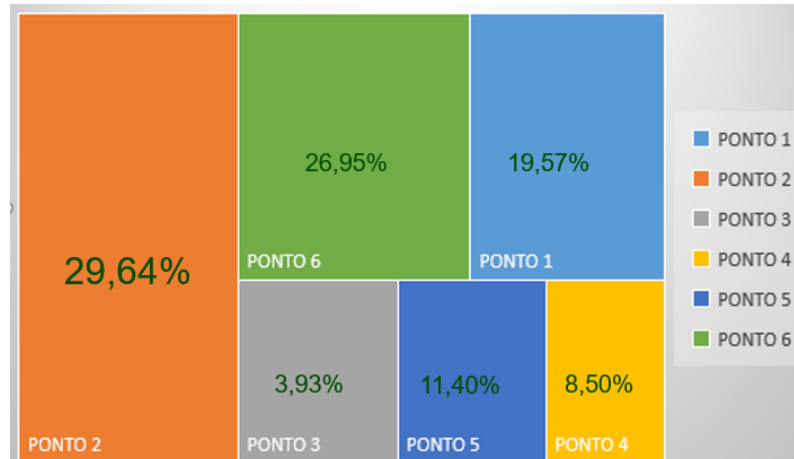


Source: Prepared by the author (2024).

This fluctuation in frequency of use may be associated with several factors, such as weather conditions, the school calendar, and specific events held in or around the park. The peak in December, for example, may be related to school holidays and milder weather, while the drop in January and February may be explained by the return to school and the rainy season, which may make access to and use of the park difficult. These data highlight the importance of considering seasonality in the management and planning of activities at the Gama Ecological Park. Offering attractions and programs that adapt to different times of the year, such as cultural events, educational activities, and leisure options for rainy days, can help keep the park attractive and popular throughout the year, ensuring that its benefits are accessible to the community in any season.

The research identified the points of greatest and least interest within the park, highlighting the preference for the synthetic grass soccer fields and the jogging track. Graph 2 illustrates the percentage distribution of user frequency at the different observation points of the Gama Ecological Park during the study period.

Graph 2- Percentage distribution of user frequency at observation points in the Gama Ecological Park.



Source: Prepared by the author (2024).

Point 2 stands out as the most frequented, with 29.64% of the records, followed by Point 6 with 26.95% and Point 1 with 19.57%. The other Points (3, 4 and 5) present considerably lower frequencies, varying between 3.93% and 11.40%. This uneven distribution suggests that certain locations and/or activities offered in the park attract a significantly higher number of users, indicating the need to analyze the factors that influence this preference and, possibly, to implement actions to promote a more balanced and diverse use of the entire space of the Park.

This information can help manage the space, directing investments towards the maintenance and improvement of these locations, in addition to guiding the creation of new areas and activities that meet the demands of the community.

Table 1 shows the frequency of visitors per point of interest in the Ecological Park.

Table 1 shows the frequency of visitors per point of interest in the Ecological Park.

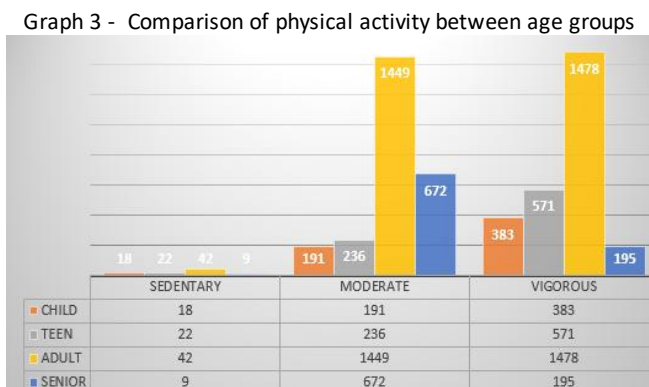
Synthetic grass football field (Point 2)	It is the most popular spot, attracting the most visitors. The preference for this location can be attributed to the synthetic grass, which allows the sport to be played in any weather conditions, and the high demand for football in the community.
Synthetic grass football field (Point 6)	Although less frequented than Point 2, this field also has a high utilization rate, suggesting that the demand for synthetic grass football fields is considerable.
Jogging track (Point 1)	The third most popular spot is the jogging track, indicating that individual physical activities, such as running and walking, are valued by park visitors.
Multi-sports court (Point 3)	The sports court ranks fourth in popularity, demonstrating that there is interest in sports such as basketball, volleyball and futsal, but at this point, as observed, those who attended rarely used the court as a sport.
Playground and community meeting point (Point 5)	This space, aimed at leisure and socializing activities, has a moderate frequency, suggesting that the park is also used for meetings and moments of relaxation.
Dirt football field (Point 4)	The dirt football pitch is the least frequented spot, possibly due to its lower quality compared to the synthetic grass pitches.

Source: Prepared by the author (2024).

The results in Table 1, demonstrate data on the community’s preferences and demands. The centrality of sports is clear, with soccer fields – especially those with synthetic grass – leading the list of most sought-after locations. This trend highlights the importance of investing in quality sports infrastructure, capable of meeting the high demand and providing leisure options for different audiences. At the same time, the significant use of the jogging track signals recognition of the importance of individual physical activity for health and well-being. On the other hand, the lower frequency of use on the dirt soccer field and the multi-sports court suggests the need to evaluate the quality of these spaces and the provision of activities that make them more attractive to the population. The table provides an enlightening overview of the use of the park, allowing us to identify strengths and opportunities for improvement so that the space becomes even more inclusive and meets the diverse needs of the community.

3.1 Physical activity levels according to age group

Graph 3 shows data compiled on the level of users who frequent the ecological park by different age groups over the months, showing the distribution of users at different levels of physical activity (sedentary, moderate and vigorous) for four age groups (children, adolescents, adults and elderly).



Caption: Children - up to 12 years old. Teenagers: from 12 to 18 years old. Adults: from 18 to 59 years old. Elderly: over 60 years old.

Source: Prepared by the author (2024).

The relationship between age group and physical activity levels was categorized into three levels: insufficiently active, moderately active, and vigorously active. Data analysis shows that children have the highest percentage of insufficiently active individuals, indicating the need to encourage physical activity from an early age. Adolescents, although they show a reduction in inactivity compared to children, still have a considerable number of insufficiently active individuals. Adults demonstrate greater engagement in physical activity, with emphasis on moderate and vigorous activities. This age group seems to be more aware of the importance of exercise for health. Elderly people, like children, have a high percentage of inactivity, which may be related to physical limitations or the lack of encouragement and adequate opportunities to practice exercise at this stage of life.

The graph thus highlights the importance of promoting physical activity in all age groups, with special attention to children and the elderly, groups most vulnerable to inactivity. Public policies and programs to encourage sports and exercise should be implemented to ensure that the entire population has access to opportunities to stay active and healthy.

3.2 Percentages of visitors and implications for the Gama Ecological Park

Within each age group (children, adolescents, adults and seniors) there are as many male and female participants. Table 2 lists these results and the percentage distribution in relation to the intensity of the activity performed (table 2).

Table 2 - Demographic results of the Age Group category and the percentage distribution in relation to the intensity of the activity performed.

CATEGORY	MEN	WOMEN	TOTAL AGE GROUP	SEDENTARY	MODERATE	VIGOROUS
Child	426	166	592	3%	34%	63%
Teen	673	156	829	2%	31%	67%
Adult	2.132	837	2969	1%	59%	40%
Senior	624	252	876	1%	77%	22%

Source: Prepared by the author (2024).

Table 2 shows that most of the park's visitors are adults, with a total of 2,969 people, 837 women and 2,132 men, representing the most active age group, with a focus on men. This

data suggests that the park satisfactorily meets the needs of this group, offering adequate infrastructure and activities, such as soccer fields and a jogging track, which proved to be one of the points of greatest interest in the research.

On the other hand, Table 2 shows the low representation of children, adolescents and women in general, demonstrating that the total of these categories is smaller than the adult category present in the park. The creation of specific leisure areas for children, the offering of activities that attract adolescents and the promotion of events aimed at women can be strategies to increase access and use of the park by these groups.

An analysis of the levels of physical activity practiced in the park reveals that most users engage in moderate or vigorous activities, which reinforces the role of the park in promoting health and well-being. However, the presence of a percentage of sedentary users, especially among the elderly, indicates the importance of offering leisure options and activities that also serve this audience, such as rest areas, accessible trails, and environmental education programs and sustainability classes.

There is a clear need for actions that promote a more diverse and equitable use of the Gama Ecological Park, ensuring that people of different ages, genders, origins and physical abilities have equal opportunities to enjoy the space and its activities. In general, this study sought to analyze the use of the Gama Ecological Park, and the results obtained reveal an interesting scenario regarding the community's relationship with this space. This corroborates the study by Thomaz (2010), who states that Brasília is a city that offers its inhabitants the option of exercising outdoors in several parks and on long, flat avenues.

The impact of a park on a city goes beyond its ecological, aesthetic and leisure functions. Green areas in cities help people to practice sports and spend their free time autonomously, without schedules. According to the systematic review by Nguyen (2021), women who live near good-quality local parks have lower rates of postpartum psychological distress or serious mental illness, and parents are more satisfied with green spaces, associating this with improved prosocial behavior in their children.

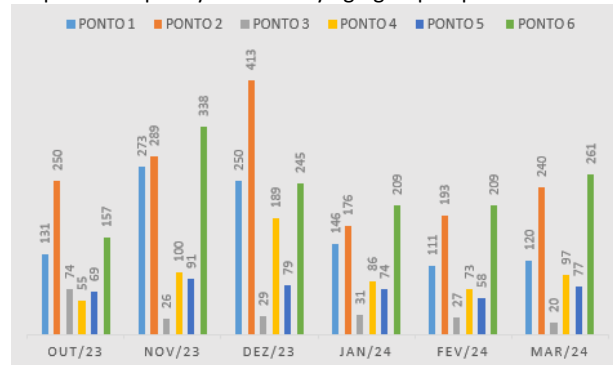
According to Sánchez and Martínez, (2021), socially, public space is of great importance because it is the place where public life takes place, it is a symbol within the territory, it is constituted by the interactions of its inhabitants with the place, as well as by the social relations carried out there.

Finding ways to encourage the population that today lives an increasingly private life (Gehl, 2013) to have social contact and practice activities outside the home is essential for maintaining mental health, reducing stress, as well as for exercising citizenship, since urban parks have the capacity to enable people to recognize themselves as part of a community, as well as develop feelings of love for life (Sandoval Chávez, 2021).

3.3 Frequencies of points according to the observation period

Graph 4 shows the frequency of visitors to six different points (Point 1 to Point 6) throughout the survey, for comparative purposes. The analysis reveals significant variations in the popularity of each point and how this popularity changes over time, possibly influenced by seasonal factors, specific characteristics of each location and time.

Graph 4 - Frequency variation by age group at points of interest



Legend: Point 1: Jogging track, Point 2: Football pitch, Point 3: Multi-sports court, Point 4: Dirt football pitch, Point 5: Children's playground and community meeting point, Point 6: Synthetic grass football pitch
 Source: Prepared by the author (2024).

With an overview of the frequency by point, we have a peak in November 2023 (338), for the syntheticgrass soccer field - point 2, in December 2023 (413) for the multi-sports court - point 3, driven by school holidays and end-of-year festivities. Points 3 (multi-sports court) and 5 (playground and PEC) present moderate frequencies, with some variations over the months and Points 1 (jogging track) and 4 (dirt field) demonstrate the lowest frequencies, with emphasis on the low use in March 2024 (20). From October to December 2023, an influence on the weather is noticeable, with a general increase in frequency at several points, possibly related to the milder spring weather and the beginning of the school holidays. In January and February 2024, attendance at some points decreased, possibly due to the return to school and the rainy season, which may have limited access or the attractiveness of some places. In March 2024, attendance decreased, especially at Points 1 and 4, which may be related to the end of the holidays and the proximity of autumn, with lower temperatures.

Analyzing each point, point 1 has low frequency in all months, with a slight increase in December 2023. Point 2 has high frequency, with a peak in December and a sharp drop in March 2024. Point 3 maintains moderate and relatively stable frequency, as does Point 5, however, with a peak in November and a drop in March. Point 4 has low frequency overall, with a slight increase in January; Point 6 has the highest frequency, with a peak in November and good utilization in March, which reveals a complex dynamic in the utilization of different points over time, and it is essential to consider both seasonal factors and the specific characteristics of each space to understand and optimize visitor frequency. The variation in the frequency of points may be related to factors such as: characteristics of the spaces, weather conditions, events and activities, and school holidays.

The analysis of the frequency of visitors to the Gama Ecological Park revealed that most of the visitors are concentrated in just three points of interest, Points 2, 6, and 1, which together account for the majority of visitors. Point 2 stands out as the most popular, attracting approximately 83% of visitors, followed by Point 6, with 52%, and Point 1, with 47%. The others, with a low concentration, suggest the need to diversify the offer of activities and attractions, in order to distribute the flow of people more evenly and avoid overloading certain areas of the park.

4 GENERAL DISCUSSION

The research proposed to present and analyze the social functions of the Ecological Park, in the Federal District, in the Administrative Region of Gama, seeking to understand its importance for the community and its contribution to the population's quality of life. Using the SOPARC methodology (McKenzie, 2006), which assesses physical activity and the profile of users in parks, data were collected on the frequency of use, forms of integration with the community and positive aspects related to leisure and health. As previously mentioned, the use of SOPARC (McKenzie, 2006) online reinforces the methodological rigor of the research, ensuring the collection of reliable data that are comparable with other studies. For Whiting, Larson and Green (2012), this is an effective tool for collecting basic data from state park visitors regarding demographic data and general patterns of use of the site. According to Lopes et al. (Lopes, 2021), SOPARC (McKenzie, 2006) is used in almost 60% of research for data collection and is designed to assess physical activity in public spaces and/or recreational areas through systematic observation. It allows data comparisons between parks, park systems, and studies (Evenson, 2016).

The results of the survey showed an unequal use of the space, with a predominance of adults, especially men, who mainly engage in vigorous physical activities. The low frequency of children, adolescents and women, in turn, indicates the need to expand the offer of activities and adapt the infrastructure to serve these audiences, promoting interaction with the park.

Regarding the ways in which the park can be integrated with the community, the research highlighted the importance of the park as a space for leisure, recreation, sports and contact with nature, in addition to its potential to promote social interaction and a sense of community. However, the analysis also revealed the need to strengthen communication and community participation in the management of the park, in order to ensure that its activities and infrastructure meet the demands of the population.

Research has also shown that parks can help promote physical and mental health, reduce stress and improve well-being, especially for adults who engage in vigorous physical activity. However, the low attendance of other groups, such as children, adolescents and women, limits the potential for these benefits to the community as a whole.

In summary, this study achieved its objectives by providing a panoramic view of the use and social functions of the Gama Ecological Park. The research not only highlighted the undeniable importance of the park for the community, but also shed light on challenges and opportunities for improvement. The results obtained provide concrete support for the formulation of strategies that aim for more egalitarian and widespread use, with the promotion of activities that attract diverse audiences and ensure full use of the park throughout the year. By fostering inclusion, diversity and consistency in the use of space, the fundamental role of the Gama Ecological Park as a place for leisure, health, well-being and environmental education is reinforced, contributing significantly to improving the quality of life of the entire population of Gama.

The low attendance at some points, such as the dirt soccer field and the multi-sports court, suggests the need to revitalize and improve these spaces. Improving the quality of the grass, installing adequate lighting, and offering sports activities and events can make these

places more attractive to the population. According to Silva and Costa Júnior (2011), physical activity needs to be perceived as attractive in order to increase the likelihood of participation. This is one of the challenges to be overcome by the family, the school, and the community: creating a care environment that meets the needs of children and adolescents, encouraging them to practice physical activities as a basic requirement for development.

Creation of leisure and social spaces for all ages, a survey revealed a low frequency of children and elderly people in some areas of the park. Baptistelli and Giacomini (2022) state that the appreciation and re-education of human beings in outdoor environments are of fundamental relevance for the quality of life, since this contact can generate considerable benefits to the individuals who use it, such as, stress relief, improvement in mental health, among other very important factors. Implementation of environmental education programs and activities of contact with nature: the appreciation of nature and the search for green spaces by the population of Gama highlight the importance of promoting environmental education.

With the implementation of these proposals, the Gama Ecological Park can become an even more attractive, inclusive and dynamic space, contributing significantly to the quality of life and well-being of the population of the Gama Administrative Region.

5 CONCLUSION

The research carried out at the Gama Ecological Park, by investigating the profile of users and their preferences, revealed a rich panorama of the use of the space and its potential. The data collected highlights the importance of the park as a meeting point, leisure and sports practice for the community, while also pointing out areas of opportunity to improve the experience of visitors and increase the social and environmental impact of the site.

Based on this analysis, this study proposes strategic improvements aimed at strengthening the role of the park as a public space of excellence, capable of meeting the diverse demands of the population of Gama and promoting quality of life, social inclusion and sustainability. The proposals include the construction of new soccer fields, the development of innovative and themed playgrounds with different levels of difficulty and sensory areas to meet the needs and interests of children. The creation of spaces for the elderly, with adapted gym equipment, game tables, sensory gardens and rest areas, which promote cultural activities and socialization for this public. The implementation of common areas to encourage family interaction and leisure. To meet the high demand for sports, the creation of a covered multi-sports court, tennis court, skate park, and areas for practicing extreme sports that seek to integrate the needs and expectations of users, as identified in the research, and the improvement of urban park management practices and the principles of sustainable development.

The implementation of the proposals, in partnership with the community and public authorities, could transform the Gama Ecological Park into a true model of urban green area, providing benefits for the health, well-being and quality of life of all its visitors.

6 REFERENCES

BAPTISTELLI, A.; GIACOMINI, Q. A. Revitalização do Parque Antônio Cláudio Machado – O Parque Urbano como mecanismo para exercer Cidadania. In: SEMINÁRIO INTERNACIONAL DE ARQUITETURA E URBANISMO, 2., 2022, Joaçaba. **Anais [...]**. Joaçaba: Editora Unoesc, 2022. p. 193-202.

BARBOSA, M. V.; PIMENTEL, R. M. de M.; BILAR, A. B. C. Multidisciplinaridade da percepção ambiental aplicada às relações homem-natureza: Revisão sistemática. **Journal of Environmental Analysis and Progress**, v. 05, n. 02, p. 180-191, 2020.

BRASIL. [Estatuto da Criança e do Adolescente (1990)]. **Lei nº 8.069, de 13 de julho de 1990**. Brasília, DF: Presidência da República, [1990]. Disponível em: <https://www.gov.br/mdh/pt-br/navegue-por-temas/crianca-e-adolescente/publicacoes/o-estatuto-da-crianca-e-do-adolescente>. Acesso em: 18 set. 2024.

CUNHA, A. D. A. *et al.* A conexão com a natureza em parques urbanos brasileiros e sua contribuição para o bem-estar da população e para o desenvolvimento infantil. **Sociedade & Natureza**, Uberlândia, v. 34, e65411, 2022.

DEROSE, Kathryn P. *et al.* Effects of park-based interventions on health-related outcomes: A systematic review. **Preventive Medicine**, v. 147, p. 106528, 2021.

DISTRITO FEDERAL (Brasil). **Brasília Ambiental - IBRAM**. Brasília, DF, 2024. Disponível em: [www.ibram.df.gov.br]. Acesso em: 18 set. 2024.

DISTRITO FEDERAL (Brasil). **GeoPortal DF**. Brasília, DF, 2024. Disponível em: <https://www.geoportal.seduh.df.gov.br/geoportal/>. Acesso em: 18 set. 2024.

EVENSON, K. R. *et al.* Park characteristics, use, and physical activity: A review of studies using SOPARC (System for Observing Play and Recreation in Communities). **Preventive Medicine**, v. 86, p. 153–166, maio 2016.

JOGDANDE, A.; BANDYOPADHYAY, A. Identifying and assessing uses of public parks: A systematic literature review. **Civil Engineering and Architecture**, v. 10, n. 3, p. 1142-1151, 2022.

LOPES, G. T. de A. *et al.* Avaliação de uso de parques por meio de protocolos da saúde pública: um estudo comparativo. **Ambiente Construído**, Porto Alegre, v. 21, n. 2, p. 225–241, abr./jun. 2021.

MCKENZIE, T. L. *et al.* System for Observing Play and Recreation in Communities (SOPARC): Reliability and Feasibility Measures. **Journal of Physical Activity & Health**, v. 3, n. 1, p. S208–S222, fev. 2006.

NGUYEN, Phi-Yen *et al.* Green space quality and health: a systematic review. **International Journal of Environmental Research and Public Health**, v. 18, n. 21, p. 11028, 2021.

NHLBI NATIONAL HEART, LUNG, AND BLOOD INSTITUTE. **Park Counters**. [S. l.], 2024. Disponível em: <https://sites.rand.org/park-counter/>. Acesso em: 18 set. 2024.

ORGANIZAÇÃO MUNDIAL DA SAÚDE. **Diretrizes da OMS para atividade física e comportamento sedentário**: Num piscar de olhos. Brasília: Organização Pan-Americana da Saúde. 2021a.

PESSOT, Elena *et al.* Natural resources in health tourism: a systematic literature review. **Sustainability**, v. 13, n. 5, p. 2661, 2021.

RUFINO, Iana *et al.* Multi-temporal built-up grids of Brazilian cities: how trends and dynamic modelling could help on resilience challenges? **Sustainability**, v. 13, n. 2, p. 748, 2021.

RUSSO, Alessio; ANDREUCCI, Maria Beatrice. Raising healthy children: promoting the multiple benefits of green open spaces through biophilic design. **Sustainability**, v. 15, n. 3, p. 1982, 2023.

SÁNCHEZ, G. J. G.; MARTÍNEZ, P. M. P. La apropiación y el uso del espacio público urbano. Los comunes en el parque urbano. **Economía, Sociedad y Territorio**, v. 21, n. 65, p. 57–85, 2021.



SANDOVAL CHÁVEZ, D. A. *et al.* Valoración económica de la multifuncionalidad de los parques urbanos. **Revista de Economía**, Mérida, v. 38, n. 96, p. 93–123, mar. 2021.

SILVA, P. V. C.; COSTA JÚNIOR, Á. L. Efeitos da atividade física para a saúde de crianças e adolescentes. **Psicologia Argumento**, Curitiba, v. 29, n. 64, p. 41–50, 2011.

THOMAZ, P. M. D. *et al.* Fatores associados à atividade física em adultos, Brasília, DF. **Revista de Saúde Pública**, São Paulo, v. 44, n. 5, p. 894–900, out. 2010.

VEITCH, Jenny *et al.* What entices older adults to parks? Identification of park features that encourage park visitation, physical activity, and social interaction. **Landscape and Urban Planning**, v. 217, p. 104254, 2022.

WHITING, J. W.; LARSON, L. R.; GREEN, G. T. Monitoring Visitation in Georgia State Parks Using the System for Observing Play and Recreation in Communities (SOPARC). **Journal of Park and Recreation Administration**, v. 30, n. 4, 2012.

STATEMENTS

CONTRIBUTION OF EACH AUTHOR

- Conceptualization: EMBP, JRT, AK; Curation of EMMP data; Analysis of EMBP, AK data; EMMP Research; EMBP, AK Methodology; AK Supervision; Design and presentation of EMBP, AK Data; Writing of the original manuscript EMBP, JRT, AK; Writing – proofreading and editing EMBP, AK.
-

DECLARATION OF CONFLICTS OF INTEREST

We, Erida Machado Barbosa de Pina, Jacqueline Roberta Tamashiro and Angela Kinoshita, declare that the manuscript entitled "THE SOCIO-ENVIRONMENTAL IMPORTANCE OF THE URBAN GREEN PARK IN THE ADMINISTRATIVE REGION OF GAMA - DISTRITO FEDERAL, BRAZIL"

1. **Financial Ties:** Has no financial ties that could influence the results or interpretation of the work. "No institution or funding entity was involved in the development of this study."
 2. **Professional Relationships:** Has no professional relationships that may impact the analysis, interpretation or presentation of the results. "No professional relationship relevant to the contents of this manuscript has been established."
 3. **Personal Conflicts:** Has no personal conflicts of interest related to the content of the manuscript. "No personal conflicts related to content have been identified."
-