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Ecosystem services in urban green areas: Contributions to the United Nations 2030 Agenda

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ABSTRACT
Urban green areas are spaces that contribute to the fulfillment of the Sustainable Development Goals (SDGs) established by the United Nations 2030 Agenda. These are spaces that can increase the offer of Ecosystem Services (SEs – *Serviços Ecossistêmicos*), which are essential to promote well-being and a healthy environment to humans. The objective of this study is the assessment of SEs offered by a green space located in São Paulo City. The *Praça Alfredo Di Cunto*, also known as *Horta das Flores*, was selected for this study. It is a public green space located in the Mooca Subprefecture, which is a region with a low green area index (2 to 5 m²/inhabitant). To assess the SEs offered by *Horta das Flores*, the methodology proposed by Gaudereto et al. (2018) named *Índice de Serviços Ecossistêmicos para Áreas Verdes* (ISEAV – Index of Ecosystem Services for Green Areas) was applied. We highlight the following results of our study: support SEs, represented by the vegetation cover and permeable areas, contribute to the achievement of goals SDG 6, SDG 13 and SDG 15; regulating SEs contribute to nutrient cycling, because litterfall is not removed; and provisioning SEs contribute to SDG 2, because *Horta das Flores* has a vegetable garden with food plants including unconventional ones. *Horta das Flores* offers many SEs, thus contributing not only to the quality of life of the regulars, but also to a more sustainable city and community (SDG 11), as it is a safe and inclusive green space.

KEYWORDS: Urban Vegetable Gardens. Green Areas. Biodiversity. Sustainability.

1 INTRODUCTION

Green areas represent social and environmental benefits advocated by the Sustainable Development Goals (SDG) of the United Nations 2030 Agenda. The agenda refers to an action plan that was ratified by 193 countries in 2015. It is composed of 17 SDGs and 169 objectives, established to promote the world's development and improve the quality of life of the world's population (ONU, 2015). In Brazil, in partnership with the guidelines of the United Nations (here referred to as ONU), the efforts converge in order to implement the 2030 Agenda in the country (ONU BR, 2016). The national goals were revised and adjusted by IPEA – *Instituto de Pesquisa Econômica Aplicada* (Institute for Applied Economics Research).

Brazil is a country of a vast, but highly endangered, biological diversity (ONU, 2018). SDG 15 refers to: "protect, recover and promote the sustainable use of land ecosystems, to manage forests sustainably, to combat desertification, to stop and reverse land degradation, and to stop the loss of biodiversity" (IPEA, 2018). SDG 15 is of extreme importance to Brazil, in the adoption of a development model that focuses on the conservation of ecosystems, once the country encompasses the second largest forest cover and the greatest extension of tropical forests of the planet. The valuation of land ecosystems must take place considering the ecosystem services. Besides the social-environmental benefits, ecosystem services also support many economic activities. The approach must comprehend the three levels: national, regional, and local, contributing with innovative proposals to the conservation of biodiversity and ecosystem services (ONU BR, 2018).

The ecosystem services (from now on, SEs) come from nature and its interactions, being essential to promote well-being and to keep the ecosystems healthy and sustainable (PASCUAL et al., 2017). The knowledge and consideration of the SEs values are relevant to the expansion of environments that supply these services (FLAUSINO; GALLARDO, 2021; ROLO et al., 2022). The assessment of the performance of these services in urban green areas is fundamental to the environmental management of the cities (LANGEMEYER et al., 2018).

Urban centers benefit from green areas, once they generate SEs, such as parks, squares, and gardens (ZHANG; MUÑOZ RAMÍREZ, 2019). These environments are considered very important, because they offer different types of SEs. Studies carried out in four European cities – Berlin, Stockholm, Rotterdam, and Salzburg – attest that the regulars acknowledge and value cultural SEs – such as recreation, aesthetic appreciation, and tourism, regulating SEs, and

provisioning SEs (BERTRAM et al., 2015). The access to public, safe, and inclusive green areas refers to objective 11.7 of SDG 11, which aims to promote more inclusive, safe, resilient, and sustainable cities and human settlements (ONU BR, 2016).

Agriculture in urban centers by means of, *e.g.*, community gardens, is a promising activity and could be better integrated to city policies, optimizing as much as possible the connections between SDGs (PEDRO et al., 2021). Urban agriculture has the potential of reducing poverty and hunger and of improving the health of the people who participate in this activity, not to mention the environmental, social and economic benefits, contributing to the SEs and biodiversity conservation (MACEDO et al., 2021; RANIERI; ZANIRATO, 2021).

Green areas directly comply with SDG 11 (Sustainable cities and communities), SDG 13 (Actions against global climate changes), and SDG 15 (Life on land) (LORENZO-SAEZ et al., 2021). Depending on how it is managed, there is also the potential of food production, contributing to SDG 2 (Zero Hunger and sustainable agriculture), and of promoting well-being and quality of life (SDG 3 – Health and well-being) (MACEDO et al., 2021). Petroni, Siqueira-Gay and Gallardo (2022) show that urban green areas can indirectly contribute with other themes, such as water provision and protection of public supply reservoirs (SDG 6 – Clean water and sanitation).

Calvet et al. (2016) state that the SEs offered by green areas can play an important role in addressing several urban policy challenges, such as the promotion of urban ecosystems management, providing opportunities of recreation and healthy life styles and promotion of social cohesion.

Green areas in urban centers promote SEs because they present structuring functions that contribute to the local sustainability. These spaces have a diversity of plant species and can significantly contribute to urban biodiversity (CALVET et al., 2016). They can be integrated to a variety of environments, such as vacant lots, areas inside schools, health units, parks and squares, promoting the recovery of degraded areas with the potential of bringing a new life to underused landscapes (MIDDLE et al., 2014).

Growing food in parks or public squares can be promising and could be much better integrated to city policies, optimizing the synergies between SDGs. Agriculture brings social and environmental benefits to the surrounding community and/or regulars, being pedagogical and participatory, when it comes to knowledge exchange, the pressure on natural environments is reduced and the climatic resilience is improved.

In face of the challenges that interconnect the objectives of SDGs of the 2030 Agenda, we present an analysis of the SEs offered by a green space located in São Paulo City. The question that guided our study was: “Which ecosystem services (SEs) are offered by a public green space?”

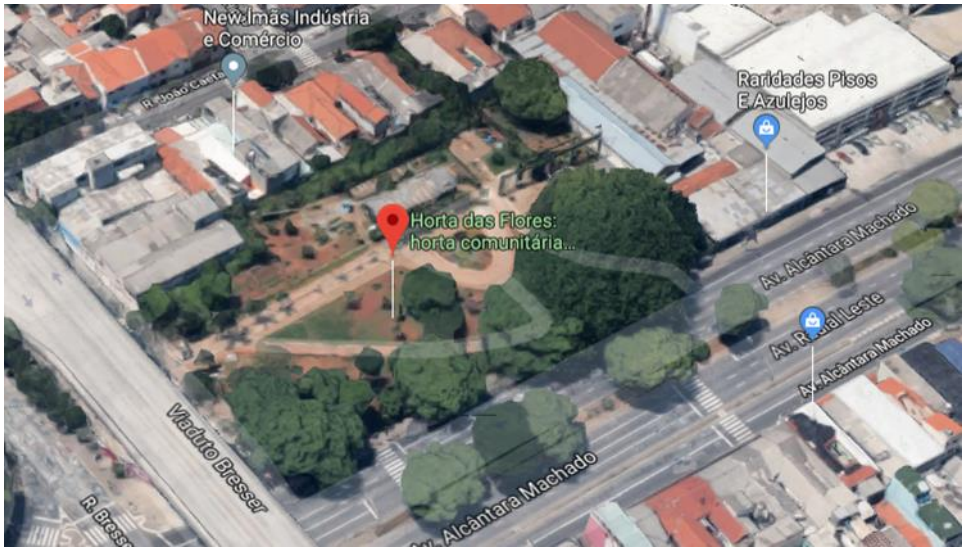
2 METHOD OF ANALYSIS

2.1 The study area

Located in São Paulo City – the largest urban center of Latin America, *Praça Alfredo Di Cunto*, also known as *Coletivo Horta das Flores,* was the green space chosen as study area (Figure 1). It is a community garden of 6.000 m^2 in area, created for the cultivation and maintenance of food, aromatic, and medicinal plants, fruit trees, and ornamental plants. Located in a city where the distribution of green areas is heterogeneous and characterized by small vegetation fragments preserved in municipal parks located in the central region and in conservation areas

in the northern and southern regions of the municipality. The vegetable garden focus of our study, besides counting on the participation of the surrounding community, has become an important space for exchanging knowledge.

Figure 1. *Praça Alfredo Di Cunto*, also known as *Coletivo Horta das Flores*, is a community green space located in the Mooca Subprefecture, East Zone of São Paulo City.



Source: Google Earth (2022)

Coletivo Horta das Flores was created in 2004 by the Prefecture of São Paulo with the auspices of the São Paulo City Urban and Peri-Urban Agriculture Program (PROAURP – *Programa de Agricultura Urbana e Periurbana da Cidade de São Paulo* – Law 13727/04 and Decree 51801/2010). For many years, *Horta das Flores* complied with PROAURP, involving vulnerable families in food production and generation of income from the sale of vegetables.

Horta das Flores was structured and a greenhouse was implemented in 2008 via the *Escola Estufa Lucy Montoro* Program. Free organic horticulture courses were offered to the population. With the end of the program, a janitor took care of the area until 2015, when a group of residents organized a community management of the space. The members created the "*Coletivo Horta das Flores*" and every month joint efforts, workshops, and various activities regarding the environment, food and nutrition security, agroecology, and environmental education were carried out (ROCHA et al., 2019).

2.2 Data collecting

The assessment of ecosystem services (SEs) followed a data collection guide organized by indicators. The Index of Ecosystem Services for Green Areas (ISEAV – *Índice de Services Ecossistêmicos para Áreas Verdes*), developed and tested by Gaudereto et al. (2018), was calculated. The objective of ISEAV is to assess the offer of SEs provided by public green areas. To collect the indicators, the spaces were divided in transects that contemplated all the extension of the study area.

The following SEs were assessed: regulation, habitat, and production (Chart 1), which are of extreme importance to the urban green areas management (JACKSON et al., 2013). Considering the scope and objectives of the study, directed to a fast and practical methodology

for the assessment of green areas, we decided not to include cultural functions in the ISEAV calculation (*cf.* GAUDERETO et al., 2018).

The identification of the plant species was mostly performed *in loco* by the field team, composed of five researchers, equipped with pencils, erasers, clipboards, pruning shears for sample collecting, cameras, and diameter tapes. When the identification of the species was impossible in the field, specialized literature was consulted (SOUZA and LORENZI, 2012), using images, branches and leaves collected in the field. The plant species were identified and characterized by habit (tree, bush, liana, herb, and creeper), origin (native – N, from Brazil –, or exotic – E, from another country), and quantified.

Chart 1 – Environmental indicators used to calculate the Index of Ecosystem Services for Green Areas (ISEAV).

Ecosystem Function	Ecosystem Service	Indicators
Regulation Function	Regulation of atmospheric gases	Out of work scale
	Regulation of the climate	Green cover
	Regulation of extreme climatic events	Permeable area and green cover
	Regulation of the water cycle	Permeable area
	Pollution filter and waste treatment	Canopy
	Water supply	Permeable area
	Soil retention	Green cover and litterfall
	Soil formation	Canopy and litterfall
	Regulation of nutrients	Canopy and litterfall
	Pollination	Richness of species
	Biological control	Richness of species
Habitat Function	Shelter Function	Habit, native / exotic Richness of species per hectare
	Nursery Function	Habit, native / exotic Richness of species per hectare
Production Function	Food	Scale of use
	Raw material	Scale of use
	Genetic resources	Scale of use (out of the scope of urban areas)
	Medicinal resources	Scale of use
	Ornamental resources	Scale of use for this purpose

Source: Adapted from Gaudereto et al. (2018).

The indicators used in the ISEAV methodology were selected on the basis of SEs discussed and worked with by De Groot, Wilson and Boumans (2002). For the regulation function, 10 SEs were considered and the following indicators chosen: green cover, permeable area, canopy, litterfall, permeable area and green cover, green cover and litterfall, canopy and litterfall. For the habitat function, two SEs were considered and the following indicators chosen: habit, native and exotic origin, and richness of species. For the provision/production function, four SEs were considered and the following indicators chosen: scale of use and scale of use for this purpose (Chart 1).

2.3 Analysis of the data

ISEAV was applied using primary data and the analysis of secondary data obtained from satellite images for the indicators cited in Chart 1. The satellite images were obtained from Google Earth, and area calculations were performed using the polygon calculation feature of the ArcGis software. After the definition of the ecosystem functions, the SEs provided by vegetation fragments in urban green areas were listed. The methodology considers that the same indicator can be used to assess different ecosystem services.

Chart 2 lists the indices and respective indicators used to calculate ISEAV. The regulating SE for atmospheric gases was not analyzed because it is a service related to large-scale climatic processes. It is therefore out of the work scale, considering the dimensions of the study area (DE GROOT et al., 2002).

The index proposed by Gaudereto et al. (2018) aims to demonstrate the range of potential ecosystem services to be generated by green areas, by selecting aspects that cover a greatest number of services that can be easily measured. The aim is to measure the whole set of functions of the ecosystem services and not only the individual services.

ISEAV is a quantitative index ranging from 0 to 10 that aims to indicate the capacity of an urban green area to provide SEs. It is presented by the quantification of the indicator(s) described in the last column of Chart 1. The index is the mean of the three indices that compose it, associated to the regulation, habitat, and production functions, also ranging from 0 to 10.

In the quantification of ecosystem functions, when the same indicator is taken for more than one function, the weight of this indicator is assigned according to the number of related services. For example, canopy is an indicator for three SEs of the regulation function index. Thus, the weight is 3 in the formula of the canopy indicator (GAUDERETO et al., 2018).

Chart 2 – Formulas to calculate the Index of Ecosystem Services for Green Areas (ISEAV) proposed by Gaudereto et al. (2018).

Abbreviation	Meaning	Formula	Details
ISEAV	Green Area Ecosystem Services Index	ISEAV = FR + FH + FP / 3	FR = Regulation Function Index FH = Habitat Function Index FP = Production Function Index
FR	Regulation Function Index	FR = D (3) + CV (3) + AP (3) + SP (3) + NE (2) / 14	Canopy (D); Green cover (CV); Permeable area (AP); Litterfall (SP); Number of tree species (NE)
FH	Habitat Function Index	FH = H + NEX + NI / 2,7	Habit (H); Native/Exotic species ratio (NEX); Number of tree species (NE)
FP	Production Function Index	FP = AF + EA + AM + EO / 1.2*	Access and use of fruit plants (AF); Economic exploration of the area (EA); Access and use of medicinal species (AM); Ornamental exploration of the area (EO)

Source: Prepared by the authors according to Gaudereto et al. (2018).

Division numbers were used to constrain the value of the function to the 0-to-10 interval. The double assessment of an area in more than one aspect does not interfere in the index calculation, once the same region provides different ecosystem services simultaneously, and the index calculation is based on the analysis of each service (via indicators) individually. The formulas to calculate the ISEAV proposed by Gaudereto et al. (2018) are listed in Chart 2 and the procedures followed to assess the indicators are presented in Chart 3.

Chart 3 – Indicators and evaluation procedure used to calculate ISEAV.

Indicator	Evaluation	Procedure
Canopy (D)	From 0 to 10	Percentage of the total area covered by tree and bush canopy divided by 10 (*e.g.*, 75% canopy cover corresponds to an indicator of 7.5).
Green cover (CV):	From 0 to 10	Percentage of the total area covered by grass or by tree and bush. The indicator is the percentage divided by 10.
Permeable area (AP)	From 0 to 10	Percentage of the total permeable area divided by 10.
Litterfall (SP)	From 0 to 10	Percentage of the total area with litterfall divided by 10.
Number of tree species (NE)	From 0 to 10	It represents the number of tree species per hectare. "10" corresponds to a number of individuals greater than 79; "9": number of individuals between 79 and 72; "8": between 71 and 64; "7": between 63 and 56; "6": between 55 and 48; "5": between 47 and 40; "4": between 39 and 32; "3": between 31 and 24; "2": between 23 and 16; and "1": between 15 and 1.
Habit (H)	From 0 to 7	Number of habits observed in the field. Seven is the maximum number of samples per hectare.
Native/Exotic species ratio (NEX)	From 0 to 10	Ratio of the number of individuals of native species and the number of individuals of exotic species per hectare. The indicator is the ratio divided by 10 (*e.g.*, 90% native species corresponds to an indicator of 9).
Access and use of fruit plants (AF)	From 0 to 3	It is calculated in a 3-point system, where the grade is assigned according to the aspect appropriation scale.
Economic exploration of the area (EA)	From 0 to 3	Calculated as previous indicator.
Access and use of medicinal plants (AM)	From 0 to 3	Calculated as previous indicator.
Ornamental exploration of the area (EO)	From 0 to 3	Calculated as previous indicator.

Source: Prepared by the authors according to Gaudereto et al. (2018).

3 RESULTS AND DISCUSSION

A total of 420 individuals were counted in *Horta das Flores*; 169 species were identified, distributed in 22 plant families (Table 1). Among the individuals identified in the study area, 190 are native and 230 are exotic. The uses of several species are mostly medicinal, nutritional, and ornamental.

The space is regarded as inclusive, accessible and green, is agreement with objective 11.7 of SDG 11 (Sustainable cities and communities). One of the indicators of this objective refers to open spaces for public use. Besides the contact with nature, *Horta das Flores* represents a multi-use space, offering leisure, social life, and environmental and nutritional education via workshops (NASCIMENTO and FRANCOS, 2021).

Table 1- Characteristics of *Praça Alfredo Di Cunto*, *Horta das Flores* in the East Zone of São Paulo City.

Characteristics	*Horta das Flores*
Total area	7,000 m²
Canopy	5,393.66
Impermeable area	2,313.99
Permeable area	4,686.01
Green cover	4,017.30
Litterfall	4,479.24
Total number of species	169
Native species	190
Exotic species	230
Habits	4
Use of fruit plants	Mean = 2
Use of medicinal species	Mean = 2
Ornamental use	0

Source: The authors, 2022.

The trees occupy areas of Horta das Flores where water infiltration is possible, not interfering with paved spaces, walls, sidewalks and walking paths. The photographs in Figure 2 show some examples of the relationship between vegetation and paved spaces.

Figure 2- Photographs of the permeable areas of *Praça Alfredo Di Cunto – Horta das Flores.*

Source: The authors, 2021.

Index of Ecosystem Services for Green Areas (ISEAV)

The results of this study indicate that, according to the calculated ISEAV as proposed by Gaudereto et al. (2018), *Horta das Flores* offers a series of ecosystem services related to regulation and habitat functions (Table 2). These data confirm that these services contribute to the sustainability of cities and many of the Sustainable Development Goals (SDG) of the 2030 Agenda. When compared to the values obtained by Gaudereto et al. (2018), the ISEAV obtained for *Horta das Flores* equals that of the square best evaluated by the authors, confirming the applicability of the index in the management of urban green areas.

Table 2- Index of Ecosystem Services for Green Areas (ISEAV) calculated for *Horta das Flores* and values attributed by Ecosystem Service (SE): regulation, habitat and production.

Square	ISEAV	Regulation Function Index	Habitat Function Index	Production Function Index
Praça Alfredo De Cunto	5.52	7.88	5.35	3.33

The number of tree species in *Horta das Flores* stands out, when considering its weight in the ISEAV calculation and the characteristics of its surroundings. *Horta das Flores* is located in a highly urbanized area and in a subprefecture with low vegetation cover indices. Photographs of Figure 3 show areas of *Horta das Flores* that favor water infiltration, soil protection, and vegetation cover, providing shading and improvement of the urban microclimate and contributing to the achievement of SDG 6, SDG 13, and SDG 15.

Figure 3- Photographs of areas *Horta das Flores* where water infiltration, soil protection and vegetation cover are favored.

Source: The authors, 2021.

According to Gaudereto et al. (2018), there can be interferences regarding the maintenance of green areas in the urban environment. This can hinder the effectiveness of some natural processes, such as the formation of litterfall, due to the impermeabilization of areas with trees and the removal of organic residues (*e.g.*, leaves), even in areas covered with vegetation. It is possible to observe in Table 3 the results of the indicators used in the calculation of each SE, as well as the contribution of *Horta das Flores* to each indicator, which is also connected to the SDGs of the 2030 Agenda.

Table 3- ISEAV Indicators.

Index	**Indicators**	***Praça Alfredo Di Cunto***
Regulation Function Index	Canopy	**7.71**
	Green cover	**5.74**
	Permeable area	**6.69**
	Litterfall	**6.4**
	Number de species	**10**
	Value of the regulation function indicator	**7.88**
Habitat Function Index	Habits	**4**
	Native /Exotic	**0.45**
	Number of species	**10**
	Value of the habitat function indicator	**5.32**
Production Function Index	Access to fruit plants	**2**
	Exploration of the area	**0**
	Access to medicinal species	**2**
	Ornamental exploration	**0**
	Value of the production function indicator	**3.33**

The application of ISEAV made the analysis of the present situation in *Horta das Flores* possible, regarding the provision of ecosystem services. This study contributes with environmental information, which allows the proper management of the green area and the

assessment of the importance of this space to the city. As stated by Elmqvist et al. (2015), urban areas are constantly dealing with pressure factors, such as demands for new real estate developments, degradation by pollution, financial resources for maintenance, etc.

As *Horta das Flores* has a vegetable garden integrated to its area, it provides a variety of ecosystem services. When considering the theoretical bases of ISEAV (DE GROOT et al., 2015; DE GROOT et al., 2002), it is observed that the area contributes with water infiltration in the soils – reducing surface runoff, and with shading (Figure 3), thus contributing to the protection and formation of soil, nutrient cycling, maintenance of the microbiota, improvement of the urban microclimate, absorption of pollution particles and gases; providing aesthetic beauty, food production, medicinal and cultural uses, and serving as shelter and support for a variety of life forms.

The production (or provision) services are products that people obtain from nature, such as food and medicinal plants. Figure 4 illustrates the diversity of food available in *Horta das Flores*, which contributes to pedagogical practices offered to visitors and participants of workshops held there. In this sense, green areas with community vegetable gardens bring countless benefits to the city – learning with professionals of the field, production of organic and unconventional food (*e.g.*, PANC), incentive to food diversity (sustainable nutrition), encouraging food reeducation, in addition to social inclusion.

Some initiatives were taken to reduce poor nutrition and extend agrobiodiversity in urban spaces, all combined with practices and knowledge of our ancestors. According to Muniz and Carvalho (2007) the implementation of vegetable gardens in urban spaces promotes the reflection of the school community on environmental issues, nutritional quality, health, quality of life, and the contact of children with ecological relationships in the natural environment of the school itself. As pointed out by Macedo et al. (2021), vegetable gardens constitute a pedagogical tool that enables the increase in consumption of fruit and vegetables, the construction of healthier eating habits.

The access to green areas is of vital importance for the health and well-being of individuals and will lead to healthier populations (SLATER et al., 2020). According to Spano et al. (2021) and Poortinga et al. (2021), public and private green areas are interlinked with the population's psychological health, fact that became much more evident during the COVID-19 pandemic. Likewise, Pouso et al. (2020) state that emotions are more positive among individuals who use spaces with green and blue infrastructure, that is, the benefits offered by ecosystem services help people become more resilient and maintain the balance between body and mind.

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Figure 4. Photographs of production ecosystem services in *Horta das Flores*.

Source: The authors, 2022.

The accelerated growth of urban centers, the destruction of forests, and the increase of environmental pollution result in the contamination of water bodies and soils, contributing to climate changes and extreme events. A large gap is observed between development with the conservation of natural resources and the disrespect of nature, thus impacting the population's quality of life.

Due to the excessive impermeabilization of the soil in São Paulo City, superficial runoff is increased, as the infiltration of rain waters is hindered. Flooding problems in the city led to the enactment of Law 17578/2021, which encourages landscape projects and the removal of the asphalt capping, promoting the reversal of impermeabilization effects in urban areas and the expansion of green areas (Law 17158, 2021). These measures strengthens the importance of green areas in respect to SDG 6, as they are related to the maintenance of the hydrological cycle.

The Mooca Subprefecture includes six municipal districts. A budget of R$ 7.1 million is projected for the maintenance of green areas and trees in 2022, according to the bill passed in 2021 (PLOA, 2022). An additional R$ 5.6 million are predicted for basic sanitation, which includes the maintenance of drainage systems, accounted for as permeable areas.

On the other hand, news circulating in the year the budget was approved read: "Mooca residents go to court to prevent construction of houses in a community garden of São Paulo" (G1, 2021). It is mentioned in the news that *Horta das Flores*, totalizing 17 years of social-environmental projects, was selected for a Public-Private Housing Partnership (*PPP da Habitação*). In other words, a green space that offers better quality of life to local residents, for having easy access to means of transport, is ceded by the Prefecture to a construction company. This information contradicts the approved budget for the maintenance of these green areas of great tree diversity.

The objective of this study was reached and it is recommended that future studies seek to expand the discussion presented here, contemplating cultural ecosystem functions of *Horta das Flores*. These services must be assessed by the community who visits the public space, because they will pinpoint the benefits for the population's quality of life via their perceptions (SANTOS et al., 2019; MARTINS et al., 2020; FLAUSINO; GALLARDO, 2021).

4. FINAL CONSIDERATIONS

The application of the Index of Ecosystem Services for Green Areas (ISEAV) allowed the assessment of the offer of different ecosystem service typologies in *Praça Alfredo Di Cunto*, popularly known as *Horta das Flores*. This green space provides a series of ecosystem services to the Mooca Subprefecture population, in special those related to the regulation and habitat functions, and to a lesser extent to production. It is interesting to observe that a small green area immersed in a grey-infrastructure matrix in the central area of São Paulo City can provide ecosystem services to the local population. We conclude that these services contribute to the promotion of urban resilience, collaborating to a sustainable city and community, to the improvement of the quality of land ecosystems, and to the defiance of climate changes in the urban environment. *Horta das Flores* contributes to many Sustainable Development Goals (SDGs) of the ONU 2030 Agenda.

Among the support SEs represented by the vegetation cover and permeable areas, these contribute to SDG 6, SDG 13, and SDG 15; regulating SEs, such as nutrient cycling, because litterfall is not removed; and the provisioning SEs (SDG 2), because *Horta das Flores* has a vegetable garden with food plants including unconventional ones. Finally, *Horta das Flores* guarantees the offer of these SEs, which contribute to the local population's quality of life, as well as to a more sustainable city and community (SDG 11), because it is a safe and inclusive green space.

This study allows to consider that ecosystem services are important proxy to assess the quality of urban green areas, acting as indicators to the assessment of the SDGs of the 2030 Agenda. It is recommended that future studies can also assess the perspective discussed here in other contexts, to strengthen this integrated research agenda and use of SDGs in urban contexts.

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