The Gree-Blue City program for management of urban afforestation in the cities of Araraquara and São Carlos, State of São Paulo

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ABSTRACT

The Gree-Blue City Program is an environmental public policy that established the Urban Afforestation as its main topic. In this regard, the general purpose of this work was to investigate the influence of the Urban Afforestation Directive of this Program for Management of Urban Afforestation in the cities of Araraquara and São Carlos, state of São Paulo. Therefore, the specific purposes were: 1) To investigate actions, best practices adopted, and difficulties found to meet criteria of the Urban Afforestation Directive in the cities of Araraquara and São Carlos, considering the context of the cities studied; 2) To know the feeling of the interlocutors from the mayor's office of the respective cities. The methodology used was an exploratory qualitative approach, by employing the following methodological procedures: bibliographical research, documentary research, and semi-structured interviews with civil servants of the cities of Araraquara and São Carlos. One of the main results was the identification of the strengths and weaknesses of the two cities, such important data for contextualizing each criterion of the Urban Afforestation Directive. It was found that the Urban Afforestation Directive (DAU) of the Gree-Blue City Program (PMVA) mobilized actions aimed at the Management of Urban Afforestation in the cities studied, taking into account their most different contexts. However, it is necessary to overcome gaps and challenges in order to comply with the DAU with continuous, lasting, and effective actions in the cities.

KEY WORDS: Management of Urban Afforestation. Green-Blue City program. Best Practices.

1 INTRODUCTION

Urban Afforestation is seen as a field of research that comprises multiple areas of knowledge and professional practices and is increasingly being incorporated into local public policies (CAICHE *et al.*, 2021; FELTYNOWSKI, 2023). Several authors discuss influence of Urban Afforestation in the cities (JONES, 2021; SILVA; LIMA; SAITO, 2023). Given the conflicts generated in the processes of land use and occupation (FELTYNOWSKI, 2023), Urban Afforestation has become an alternative for improving living conditions in cities and a nature-based solution for adapting and mitigating the effect of climate change (CHAKRABORTY *et al.*, 2022).

Nonetheless, Urban Afforestation projects, actions, management practices, and public policies must be thought of in an integral and complete way. It is not enough to simply delimit places for planting trees, without planning, continuous management, resources, and involvement of the various agents that work in urban spaces. (CASTRO; DIAS, 2013).

In 2007, the Government of the State of São Paulo created the Green-Blue City Program (PMVA), an environmental public policy that established the Urban Afforestation as its main topic. The PMVA was developed with the purpose of "measuring and supporting efficiency of environmental management, aiming to encourage São Paulo city halls to execute their strategic public policies for sustainable development" (SIMA, 2019).

Assessment of the cities is based on ten Environmental Directives (DAs) that compose the PMVA, namely: Sustainable City, Environmental Structure and Education, Environmental Council, Biodiversity, Water Management, Air Quality, Land Use, Urban Afforestation, Treated Sewage, and Solid Waste. Each Directive establishes minimum criteria for the city to score in the Environmental Assessment Index (IAA), thus resulting in an "Environmental Ranking of the State of São Paulo", which annually publishes the score of each city (SIMA, 2019).

Studies found contributions from the PMVA regarding improvement of city the environmental management: Rezende *et al.* (2019) revealed that greater effort to raise own

Periódico Eletrônico **"Fórum Ambiental da Alta Paulista"**
Electronic Journal **"Environmental Forum of Alta Paulista"**

ISSN 1980-0827 – Volume 19, Number 5, Year 2023

resources or greater investment in public policies, such as environmental management, had a positive impact on the Environmental Assessment Index. On their turn, Moraes *et al.* (2019) showed that, in addition to the environmental focus, the PMVA Directives also deal with economic, political and social aspects. Dantas and Passador (2019) verified compatibility between the DAs and PMVA and the Sustainable Development (SDG) of the United Nations (ONU).

However, gaps and improvements required for advancement of the Program were also found. Machado and Montaño (2012) detected that the city of São Carlos had stopped actively participating in the PMVA due to bureaucracy focused on documentation and did not address the practical needs of managers. Konrad (2014) found the low expression of several impact indices analyzed, thus revealing that the PMVA still has challenges in the medium and long term for the Urban Afforestation Directive (DAU) becomes as relevant as it could be. Costa (2015) recommended higher weight for the DAU in the PMVA and that the most deficient criteria had greater representation in the Directive.

Specifically. regarding the DAU during the period from 2008 to 2012, there was evolution in requirements of the criteria set out therein (KONRAD *et al.*, 2013). However, improvements are still needed, especially regarding regulations in local legislation (NESPOLO et al., 2020).

Therefore, there is a need to overcome knowledge gaps. One of these gaps is the deepening of studies based on the realities of the cities of the state of São Paulo, thus seeking to identify advances, difficulties, and suggestions for improvement in criteria of the Urban Afforestation Directive, as well as the improvement of public policy in general, which can serve as a reference for other Brazilian states.

2 PURPOSES

2.1 General Purpose

The general purpose of this work was to investigate the influence of the Urban Afforestation Directive, of the Green-Blue Program, for Management of Urban Afforestation in the cities of Araraquara and São Carlos.

2.2 Specific Purposes

- Investigate actions, good practices adopted, and the difficulties found to meet the criteria of the Urban Afforestation Directive in the cities of Araraquara and São Carlos, considering the context of the studied cities.
- Know the feeling of the interlocutors from the mayor's office of the respective cities.

3 METHODOLOGY

3.1 Methodological procedures

This research used exploratory qualitative, by employing the following methodological procedures: bibliographical research, documentary research, and semi-structured interviews with civil servants of the cities of Araraquara and São Carlos.

The bibliographical research was carried out on the main academic portals and databases, applying a combination of the following key words: "Arborização Urbana" [*Urban Afforestation*]; "*Gestão municipal*" [City management]; "*Município Verde Azul*" [Green-Blue City]; and "*Diretiva de Arborização Urbana*" [Urban Afforestation Directive].

In the documentary research, the website of the Infrastructure and Environment Office (SIMA) of the State of São Paulo and the official websites of the city halls of Araraquara and São Carlos were consulted. In addition to all supporting documents sent to the Gree-Blue City Program (PMVA) in 2017 e 2018, provided by interlocutors of the respective city halls. Interlocutors or alternates are representatives appointed by the mayor, through official letter, as well as contact people between the municipality and the coordination and technical team of the PMVA (SIMA, 2018).

In the semi-structured interviews, a pre-defined guide was used, which consisted of ten questions (Table 1), with the aim of investigating the feeling of interlocutors from the cities of Araraquara and São Carlos, considering the actions, good practices adopted, and the difficulties encountered in relation to the criteria of the DAU. Research was approved by the Human Research Ethics Committee - CEP (Certificate of Presentation for Ethical Review - CAAE: 25450619.8.0000.5504). After initial contact and approval by the CEP, the interlocutors signed a Free and Informed Consent form (TCLE) before conducting the interviews. Supporting documents and semi-structured interviews were analyzed using content analysis techniques based on Bardin (2016), following three phases: 1) Pre-analysis phase; 2) Material exploration phase and; 3) Results processing and interpretation phase.

Table 1 - Questions from the interview guide directed to interlocutors of the Green-Blue Program of the cities of Araraquara and São Carlos.

Questions from the semi-structured interview guide
1. Regarding the ten PMVA Environmental Directives: How do you assess the importance of Directive x for the environmental management of your City? Very important; Important; Little important; Not important
2. Regarding the Urban Afforestation Directive (DAU), What is your opinion on information provided in SMA Resolution No. 33/2018 ("leaflet") that defines what must be fulfilled in each action? Is this information clear? Have you ever needed help understanding them? What would you change to make understanding of this information more accessible?
3. Regarding the criteria of the Urban Afforestation Directive: 3.1. What is being done to develop and implement "*ESPAÇO ÁRVORE*" [TREE SPACE] on the roads of your City? What difficulties were found and best practices were adopted to meet this criterion? 3.2. What is being done to register and/or inventory trees in your city? What difficulties were found and best practices were adopted to meet this criterion? 3.3. What is being done to develop and implement the Urban Afforestation Plan in your City? What difficulties were found and best practices were adopted to meet this criterion? 3.4. What is being done to develop and execute the *Piloto de Floresta Urbana* [Urban Forest Pilot] in your City? What difficulties were found and best practices were adopted to meet this criterion? 3.5. What is being done to enable professionals from the municipal structure involved with Urban Afforestation to be trained in your City? What difficulties were found and best practices were adopted to meet this criterion?

| Questions from the semi-structured interview guide |
|---|
| 3.6. What is being done to prepare a publication on Urban Afforestation in your City? What difficulties were found and best practices were adopted to meet this criterion? |
| 3.7. What is being done to comply with the Action in the Green-Blue program for environmental education in your City? What difficulties were found and best practices were adopted to meet this criterion? |
| 3.8. What is being done to measure vegetation cover in the urban perimeter of your City? What difficulties were found and best practices were adopted to meet this criterion? |
| 3.9. What is being done as an action in the Green-Blue program (pro-activity) in your Municipality? What difficulties were found and best practices were adopted to meet this criterion? |
| 4. Are all criteria consistent with the reality of your City? What would you change to make them more suitable? |
| 5. Would you exclude any of the criteria from the Urban Afforestation Directive? Which? Why? |
| 6. Would you include any of the criteria from the Urban Afforestation Directive? Which? Why? |
| 7. In your opinion, with the participation of your City in the PMVA: |
| 7.1. Were there any changes in Urban Afforestation planning? Which? |
| 7.2. Were there any changes in Management for Urban Afforestation? Which? |
| 7.3. Was there any improvement in terms of quantity and quality of the Urban Afforestation? Which? |
| 7.4. Was there any type of engagement by employees, managers, or the population in Urban Afforestation activities? Which? |
| 8. Where are the seedlings for new plantings produced? Does your city have a plant nursery or similar location? |
| 9. How the structure of Urban Afforestation Management in your City is divided? |
| 10. Do you have anything to add? |

Source: Own elaboration.

3.2 Cities researched

Araraquara and São Carlos were chosen due to correlations established by the two cities of the state of São Paulo: they are medium-sized cities with similar socio-spatial and environmental aspects and dynamics, they have a predominance of the same phytogeographic domains (Cerrado and Atlantic Forest), belong to the same Water Resources Management Unit (UGRHI) 13 (Tietê-Jacaré Basin) – additionally, they are cities close to each other, separated by approximately 40 km, and influence on the regional context.

3.2.1 Araraquara

The city of Araraquara, located in the interior of the state of São Paulo (Figure 1), has approximately 236,072 inhabitants and area of the territorial unit of 1,003.625 km² (IBGE, 2019).

Figure 1 - Location of the municipality of Araraquara, highlighting its urban area.
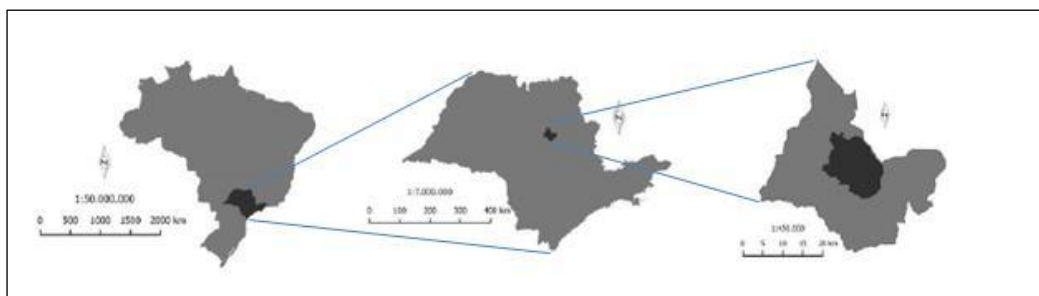

Source: Oliveira *et al.,* (2018).

According to Menzori e Falcoski (2017), the predominant vegetation cover in the municipality, in 2009, was composed of semi-deciduous seasonal forest, tree/shrub growth in floodplain and savannah regions. Currently, two main types of biomes stand out: Cerrado and Atlantic Forest (IBGE, 2019).

According to Miranda *et al.* (2011), Araraquara presented the index of 34.2 m² of green area per inhabitant. This fact can be considered a good indicator, according to data from the Brazilian Society of Urban Afforestation (SBAU), which recommends a minimum of 15 m² of green area per inhabitant (ARRUDA *et al.*, 2013). However, the city's vegetation coverage can still be considered uneven, in addition, the variety of species is still very low. (OLIVEIRA *et al.*, 2018).

3.2.2 São Carlos

Located in the interior of the state of São Paulo (Figure 2), the city of São Carlos has an estimated population of 251,983 inhabitants and its territorial unit area is 1,136.907 km² (IBGE, 2019).

Figure 2 - Location of the municipality of São Carlos, highlighting its urban area.
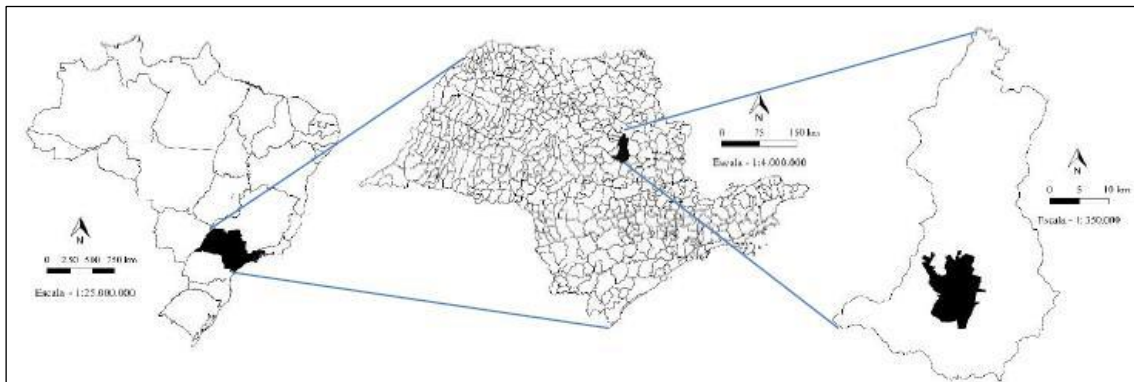
Source: Scarpinella e Silva (2019).

The predominant primary vegetation cover in São Carlos was composed of semi-deciduous forests, riparian forests, cerrado, cerradão, and semi-deciduous forest with *Araucaria angustifolia* (SCARPINELLA; SILVA, 2019). Currenty, there is a prevalence of two main types of biomes: Cerrado and Atlantic Forest (IBGE, 2019).

Viana (2013) measured the tree cover of the urban area of São Carlos, by dividing it into 44 sectors, for the calculations, and using the Urban Forest Index (IFU) and percentage. Results showed good quality of urban forest, in general, but calculations by sectors showed that this tree cover is not yet well distributed in the city. The lowest percentages of tree cover surveyed are found in lower-class neighborhoods and in the central region.

4 RESULTS AND DISCUSSIONS

Analysis carried out in the bibliographical and documentary research revealed some advances in the criteria for assessing the Urban Afforestation Directive (DAU) (Table 2). The main advances observed in the PMVA history, since its creation until the period analyzed, were: the inclusion of pro-activity as a criterion: the possibility of including obstacles and difficulties in the Environmental Management Plan and; the increase in weight of the DAU for calculation of the IAA.

Table 2 - Criteria for assessing the Urban Afforestation Directive (DAU)

DIRECTIVE 08 – URBAN AFFORESTATION (AU) - CRITERIA		
ATTITUDE	AU1	Develop and implement **"Espaço Árvore"** on the roads (mandatory in new subdivision of lots) and publicize it. This space must be defined by legal provision.
MANAGEMENT	AU2	To **Register and/or Inventory**, and consequently diagnose, the trees of the city
	AU3	Prepare and implement the **Municipal Urban Afforestation Plan**
	AU4	Develop and execute the *Piloto de Floresta Urbana* and publicize it
	AU5	Enable professionals from the municipal structure involved with Urban Afforestation to be trained and to reproduce the knowledge of the city
	AU6	Prepare **publication on Urban Afforestation**
	AU7	Action for Green-Blue program of **environmental education with "participatory management"**
RESULT	AU8	**Vegetation cover** in the urban perimeter

Source: SIMA State Resolution No. 33/2018.

According to Pires *et al.* (2015), sending supporting documents can help verify effectiveness of municipal initiatives, in addition to measuring how much improvement there has been. However, regarding score of the supporting documents of 2017 and 2018, a quantitative evolution of the score of the DAU in Araraquara and São Carlos (Figure 3) was observed. Although, there are necessary improvements, with emphasis on communication between the team responsible for the PMVA and the cities, clarifying the way in which the criteria are analyzed to achieve the expected score.

Figure 3 - Expected and received score for São Carlos in the DAU of 2017 and 2018
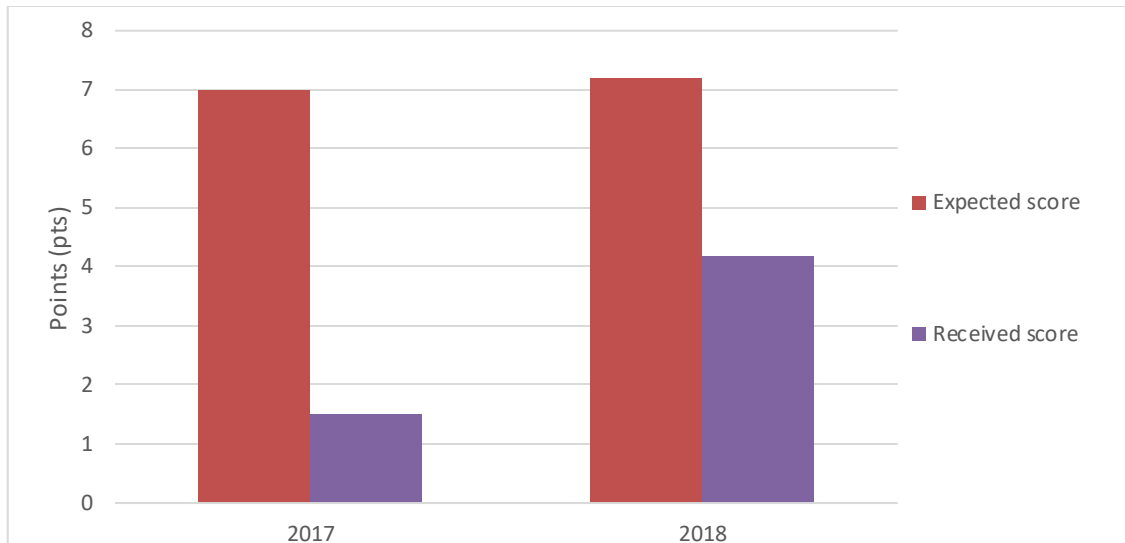
Source: Own elaboration.

The analyzed supporting documents were of 2017 e 2018, and the semi-structured interviews were performed in 2020. Even with these temporal frames at different times, in the analysis, it was possible to identify some aspects that revealed difficulties and good practices in carrying out actions in each criterion of the DAU. In addition to enabling identification of the main strengths and weaknesses observed in Management of Urban Afforestation (GAU) of the cities studied.

The need for adjustments between the PMVA and local policies was observed. As, even if the criteria are included in municipal laws, if they are not identical to the criteria requirements, they do not count in the score. This fact occurred in criterion AU1 (Espaço árvore), provided that the term "espaço árvore" [tree space] and its sizes are not yet explicit in legislation, but the cities have implemented them based on the existing laws and regulations (Figure 4). Furthermore, even if specific laws and regulations on the matter are published, it is necessary that their guidelines and proposed instruments are implemented by management, as the existence of laws does not ensure efficiency of the GAU.

Figure 4 - Example of one of the 29 tree spaces implemented in Araraquara

Source: Supporting documents of Araraquara, 2018.

None of the municipalities analyzed had a complete inventory, which was a disadvantage in the score for criterion AU2 (Register and/or inventory). Moreover, this fact impairs municipalities regarding efficiency of the GAU. The lack of team, resources, continuity in data collection and monitoring influenced the lack of complete inventories. In this case, Partnerships with Universities and other associations proved to be good alternatives to alleviate these problems. Initiatives like these should be encouraged.

In São Carlos, supporting documents of criterion AU2 were only sent in 2017, and they included inventory data from two squares with the characterization and photos of existing trees, fulfilling the diagnosis, an action requested by the PMVA, in addition to a map highlighting the public areas. The maps can promote prognosis focused on specific future actions.

Differences were found in the preparation of Urban Afforestation Master Plans (PDAUs) of the cities of Araraquara and São Carlos. This may have been a result of the PMVA guidelines that request the PDAU to consider a 12-year period and include a physical schedule. However, its preparation does not have minimum requirements. Inclusion of these requirements is proposed as an improvement to criterion AU3 (Urban Afforestation Plan), which could help and support the teams responsible for the PDAUs.

The greatest difficulty of the cities studied, in criterion AU4 (*Piloto de Floresta Urbana*), has been implementing the Pilots on the main roads in regions already consolidated of the city, due to the size of the sidewalks and conflicts with the existing infrastructure. Anyway, they are being done in as many places as possible. If more viable alternatives were provided, such as, for example, implementation on the banks of streams existing in urban areas or exclusion of the need for the pilot to occupy both sides of the street, perhaps this criterion could better cover the reality of different cities.

In criterion AU5 (Training of professionals), few annual trainings were observed. However, the process of training technical professionals on this topic cannot be done only at specific moments. Actions to encourage training on Urban Afforestation for municipal technicians (such as participation in Congresses, Courses, and other events) contribute a lot to improvement of the GAU and must be structured as a set of continuous educational actions.

In criterion AU6 (Publication of afforestation), the biggest challenge has been raising awareness among the population that still sees the tree as a problem. Even so, this criterion has mobilized publications involving different types of media and printed materials on Urban afforestation. Raising people's awareness involves not only an environmental issue, but a cultural change. In this sense, it is suggested that the bodies responsible for the Management of Urban Afforestation seek to act in an integrated manner with other municipal sectors, seeking ways to face this obstacle.

In criterion AU7 (Environmental education actions) was the only one that revealed an integration initiative with another criterion, - the AU1 -, as in Araraquara, the tree space was included in some of the plantings made. Criterion AU7 generated greater mobilization of actions in the two cities studied, including projects, formation of partnerships and involvement schools for plantations with participatory management (Figure 5). The adherence of the city to the PMVA is one of the ways to encourage population to preserve the environment, as they end up getting involved in socio-environmental actions that favor their quality of life and improvement of the city. (LIMA *et al.*, 2015).

However, these actions are not yet part of an integrated and continuous planning structure, since, prior to planting, the inventory and diagnosis stages are fundamental for integrated planning. Furthermore, the project of Urban Afforestation in the city implies dialogue with a series of fields of knowledge and action.

Figure 5 - Planting through the urban orchards project in São Carlos - 2018.

Source: Supporting documents of São Carlos 2018.

Cities have been seeking to include the theme of Education on Urban Afforestation, mainly through actions in public schools. However, just like training actions, educational actions must promote critical and participatory education with lasting initiatives. Julião (2020) emphasizes the urgency in training public agents of the cities so that Environmental Education action proposals can enable creation of mechanisms that encourage the direct participation of citizens in these actions.

Criterion AU8 (Vegetation cover) was one of the criteria that generated the most doubts in the guidelines provided by the PMVA. As the software *Multispec*, which is

recommended for this type of analysis, does not always accurately detect different types of vegetation, and the division into four quadrants can limit sectoral divisions that vary in each municipality.

The criterion PRO encouraged actions focusing on areas that needed maintenance or management in the cities. Therefore, cities formed partnerships with companies, projects, universities, or the community in general (NESPOLO, 2020). Additionally, in 2017, the city of São Carlos instituted a Municipal Decree creating urban parks, aiming at preserving forest fragments. Araraquara has a municipal plant nursery, demonstrating mobilization for production of the seedlings necessary for plantings foreseen in criterion AU3.

Finally, in São Carlos, encouragement of the manager of the Urban Afforestation sector revealed the importance of municipal leaders for engagement of the team. In Araraquara, the greater investment of financial resources proved to be essential for carrying out more complete actions on the DAU topic, as it allowed hiring of new employees and acquisition of equipment to improve and speed up some actions, such as: images with better spatial resolution and drones to record coverage plant, in addition to the engaging of the tomography service, which was considered a proactive action.

Below, in tables 3 and 4, these points are presented in order to summarize all points observed in the feelings of the interlocutors.

Table 3 - Strengths and weaknesses of the city of Araraquara to meet criteria of the DAU.

CRITERIA	STRENGTHS	WEAKNESSES
AU1	It has legislation that incorporates the Urban Afforestation (AU) topic, including in the Master Plan (PD). Implementation of tree spaces in locations that have the necessary sizes.	Difficulties in finding alternatives to insert the AU in regions already consolidated of the city. Legislation on AU does not include tree space yet.
AU2	Partnership initiative with the local university to carry out some necessary actions for the AU. Employees have already managed to carry out a large part of the inventory and continue to carry out the service. Therefore, there are current data.	The city has only one complete inventory to direct actions related to the AU.
AU3	The PDAU was linked to the legislation, which has been used as support by the AU team and updated frequently; Investment in hiring new employees.	Even though it serves as support for the AU team, the PDAU needs to be reformulated.
AU4	There was a competition to hire employees for the AU, what could enhance this practice, including implementation of Pilots.	As noted in criterion AU1, this is likely to be a challenge in consolidated regions of the city.
AU5	New employees were hired for the AU sector in the second half of 2019, and older employees have been training them.	They were not identified in the answer to the Question related to criterion AU5.

CRITERIA	STRENGTHS	WEAKNESSES
	Training carried out with employees not directly linked to the AU has included outsourced workers. There is monitoring by municipal technicians for maintenance of the AU carried out by outsourced workers. The city has held meetings with electricity companies to find alternatives that minimize drastic pruning.	
AU6	The city has used different types of media to produce and publish information about the AU;	There is a challenge in raising awareness among the population who see tree as a problem.
AU7	The city has universities and colleges with which it can form partnerships to carry out practices related to the AU. Projects carried out in schools have had reciprocity with the population involved in planting. Schools have made space in the Collective Pedagogical Work Schedule (HTPC) for AU projects with teachers, who are knowledge multipliers.	Environmental education projects are still very focused on planting, but could encompass other actions necessary for management of the AU.
AU8	The city has invested in equipment and high-resolution images to improve tree cover surveys. The AU team is not limited to what the PMVA requests, it rather seeks other techniques to improve calculations of vegetation.	They were not identified in the answer to the Question related to criterion AU8.
PRO	The city has formed partnerships to overcome the lack of resources for maintaining municipal green areas. The city has invested money in equipment and outsourced labor to diagnose trees in danger of falling.	They were not identified in the answer to the Question related to the criterion PRO.

Source: Own elaboration.

Table 4 - Strengths and weaknesses of the city of São Carlos to meet criteria of the DAU.

CRITERIA	STRENGTHS	WEAKNESSES
AU1	It has legislation that incorporates the Urban Afforestation (AU) topic, including in the Master Plan (PD). Inspection before releasing subdivisions of lots, verifying compliance with the minimum requirement for trees per lot.	Legislation on AU does not include tree space yet.
AU2	The municipality proposed to invest resources in a tender to prepare the PDAU, which will include the inventory.	The municipality does not yet have a complete inventory of any region of the city to direct actions related to the AU.
AU3	The PDAU was linked to the legislation, which has been used as support by the AU team; Opening of tenders for the development of a new PDAU.	The current PDAU is closer to an afforestation code, and the development of a new one depends on the bidding, which is open.
AU4	The AU team is selecting areas that may receive Urban Afforestation Pilots (*Pilotos de Arborização Urbana*).	Many criteria of the DAU (AU1, AU2, AU3 e AU4) are depend on preparation of the PDAU under tender.
AU5	Employees from the two main secretariats of the UA sector participate in training sections and share the knowledge acquired with each other and with other actors involved with the AU. The AU team is not limited to the courses offered by PMVA, thus seeking specialized courses and new techniques for tree management and maintenance.	The afforestation sector is separated into two departments that are physically distant.
AU6	The city has used different types of media to produce and publish information about the AU; The team is attentive to the population's demand for technical guidance and provides information when necessary.	There is a challenge in raising awareness among the population, for example, regarding management of the trees in their sidewalks.

Periódico Eletrônico "Fórum Ambiental da Alta Paulista"
Electronic Journal "Environmental Forum of Alta Paulista"

ISSN 1980-0827 – Volume 19, Number 5, Year 2023

CRITERIA	STRENGTHS	WEAKNESSES
AU7	The city has universities and colleges with which it can form partnerships to carry out practices related to the AU. Projects carried out in schools have had reciprocity with the population involved in planting. Inclusion of plant nurseries in schools may contribute to the production of seedlings that takes place in the municipal plant nursery in the city.	Environmental education projects are still very focused on planting, but could encompass other actions necessary for management of the AU.
AU8	Employees support each other to meet the requirements of the PMVA. The AU team uses as many tools as possible to make calculations of vegetation.	Investment in better resolution images would contribute to more accurate results when surveying tree cover.
PRO	The city has formed partnerships to overcome the lack of resources for maintaining municipal green areas. The city has a plant nursery, an item that is not mandatory in the criteria. A project to create urban parks in the city was established by decree, and a working group was created to plan them, connecting public spaces	They were not identified in the answer to the Question related to the criterion PRO.

Source: Own elaboration.

In addition to elucidating the strengths and weaknesses of the two cities, this type of data is important for contextualizing each criterion in the DAU. And it can be incorporated, later, with data from other cities and other PMVA Directives, if creating a future information system related to the Program.

5 CONCLUSION

It was found that the Urban Afforestation Directive (DAU) of the PMVA mobilized actions aimed at Management of Urban Afforestation in the cities studied, in their most different contexts. However, it is necessary to overcome gaps and challenges in order to comply with the DAU with continuous, lasting, and effective actions in the cities.

The actions carried out by the cities to comply with the DAU are still very fragmented by criteria. Before educational actions and planting, Urban Afforestation planning in the

municipality in a continuous and integrated manner is necessary.

Interlocutors of the PMVA who were interviewed demonstrated engagement and active involvement in the actions mobilized to comply with the DAU, thus revealing that this commitment, as well as that of the entire team and managers, has positive effects on local management for this topic. In São Carlos, the encouragement from the manager of the AU sector made clear how important are the municipal leaders for team engagement.

In Araraquara, the greater investment of financial resources proved to be essential for carrying out more complete actions on the DAU theme, as it allowed hiring of new employees and acquisition of equipment to speed up some actions, such as: improving images of vegetation cover, such criterion generated greater doubts for the cities.

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