THE MANAGEMENT OF GREEN AREAS IN THE MUNICIPALITY OF SÃO PAULO: ADVANCES AND LIMITATIONS[1]

AMANDA SILVEIRA CARBONE[2]
SONIA MARIA VIGGIANI COUTINHO[3]
STEPHAN TOMERIUS[4]
ARLINDO PHILIPPI JUNIOR[5]

Introduction

In Brazil, 84% of the population lives in urban areas (Brazilian Institute of Geography and Statistics - IBGE, 2010) causing a number of problems and affecting quality of life. In addition, the Intergovernmental Panel on Climate Change (IPCC) forecasts climate changes (IPCC, 2013) which may aggravate environmental and social imbalances, particularly in cities.

Within this context, the lack of green spaces is an aggravating factor, as the high impermeability rate in cities intensifies the formation of urban heat islands (LOMBARDO, 1985), affects air quality (SARTOR *et al.*, 1995) and increases the intensity of flooding incidents (BEZERRA and FERNANDES, 2000).

Green urban areas have a key role in improving the quality of life in cities. Among the various environmental benefits of vegetation in urban environments, the following stand out: an improvement in air quality (NOWAK and DWYER, 2007), a decrease in temperature (MONTEIRO, 2002) and a reduction in rainwater surface runoff in impermeable areas (BOLUND and HUNHAMMAR, 1999).

Similarly, Levent and Nijkamp (2004) argue that the quality and viability of cities are highly dependent on the design, management and maintenance of green urban areas. There are many studies regarding the management of green urban areas in the Municipality of São Paulo (PHILIPPI JR. and BRUNA, 1998; SILVA FILHO, 2005, COELHO, 2008; MELLO-THÉRY, 2011; SEPE and PEREIRA, 2012; LIMNIOS and FURLAN, 2013). However, no studies were found that focus on the management of green areas as a whole, encompassing legal, economic, administrative and institutional instruments.

1. Grant # nº 133347/2012-5, Brazilian National Council for Scientific and Technological Development (CNPq) and Grant #2012/02605-4, São Paulo Research Foundation (FAPESP).
2. Master and PhD student at School of Public Health – USP. E-mail: amanda_scarbone@hotmail.com
3. PhD in Science at School of Public Health – USP. E-mail: scoutinho@usp.br
4. Professor at Birkenfeld Campus, Trier University. E-mail: tomerius@umwelt-campus.de
5. Full Professor at School of Public Health – USP. E-mail: aphij@usp.br

The Municipality of São Paulo has 11,446,275 inhabitants and a demographic density of 7,525 hab/km² (System of Data Analysis Foundation of the São Paulo State - SEADE Foundation, 2013). It is the main city in the São Paulo Metropolitan Region where economic, social and cultural activities are concentrated. It has an area of 1509 km², of which 1000 km² is urbanized (SEMPLA, 2009).

Taking into consideration how the São Paulo Municipality has addressed urban problems relating to green areas and the importance of environmental management as a strategy to improve environmental quality, as well as to promote living standards and sustainability, this study seeks to analyse São Paulo's public management of green areas.

The methodology involved a literature review, documental research and the development of an analysis model using instruments and tools necessary to implement an appropriate management structure for green areas. Interviews were also conducted with key actors.

The analysis model enabled us to examine whether the public management of São Paulo›s green areas is moving towards sustainability. It was developed based on studies by Levent and Nijkamp (2004), Milaré (1999), Philippi Jr. and Bruna (1998), Zulauf (1998), and Salles (2000).

Although Agenda 21 was introduced in 1996, it remains the principle long-term strategic planning document in terms of sustainability. Given this fact, an analysis of the objectives of the São Paulo Municipality›s Local Agenda 21 chapter on green areas was conducted in light of the findings of the interviews, documents and literature review. The 2002 and 2014 Strategic Master Plans were also considered in this study.

Agents directly involved with the municipality›s green areas management, members of civil society and researchers in this area were selected for interviews. In this way, four categories of actors were established: public managers, civil society members, legislative representatives and researchers.

To conduct the interviews, a semi-structured script was used (MINAYO, 2004) and the number of interviews was defined based on the process of deliberate sample saturation. In this method, a sample is considered to be representative when no new information is added to what is already known about the investigated phenomenon (theoretical saturation) (THIRY-CHERQUES, 2009). After interviews were fully transcribed, a content analysis was conducted (BARDIN, 1977).

Results and discussion

The analysis model developed contains planning instruments and elements considered essential for the implementation of well-structured green areas management. These instruments were divided into four categories: legal, economic, administrative and institutional. Subsequently, relevant aspects to green areas management planning were considered.

Legal Instruments

São Paulo is legally well equipped to conduct the management of green areas. There are federal, state and municipal instruments which govern the territory and are either directly or indirectly associated with the creation and/or protection of green areas.

The 1988 Brazilian Federal Constitution shows a concern with the environment and its management, in particular by strengthening the role of municipalities.

At the federal level, in addition to the Constitution, the following instruments stand out: the National Environmental Policy (Federal Law n. 6.938/98) which establishes the National Environmental System – (SISNAMA), whose remit encompasses all three levels of government; the Law of Environmental Crimes (Federal Law n. 9.605/98) which sets out criminal and administrative sanctions related to activities and behaviours damaging to the environment; the New Forestry Code (Federal Law n. 12.651/2012) and the Atlantic Rainforest Law (Federal Law n. 11.428/2006, regulated by Decree n. 6.660/2008), which addresses the use and protection of this biome's native vegetation.

At State level, the following instruments are worth emphasising: the Environmental State Policy (State Law n. 9.509/97); State Laws ns. 898/75 and 1.172/76, regulating land use for the protection of water sources, courses and reservoirs, as well as other water sources in the Metropolitan Region of São Paulo; and State Decree n. 30.443/89 which addresses environmental heritage and establishes a ban on the felling of particular tree species in the Municipality of São Paulo.

At the municipal level, Municipal Law n. 16.050/2014 approves the Urban Development Policy and the Strategic Master Plan for the Municipality of São Paulo. The Strategic Master Plan - (PDE) - is an instrument set out in the Statute of the City (Federal Law n. 10.257/2001) which defines the main foundations of urban policy, thus becoming an important environmental management instrument, given that urbanization is one of the processes which most impacts on the environment (BRAGA, 2001). Municipal Law n. 10.365/87, regulated by Municipal Decree n. 28.088/89, addresses the cutting and pruning of tree-sized vegetation in the Municipality of São Paulo; Municipal Law n. 14.186/06 sets out the Municipal Urban Tree Maintenance Program and establishes the municipal policy for managing green urban areas; and Municipal Law n. 10.948/91 concerns compulsory tree-planting in thoroughfares and green areas in land subdivision projects.

With regard to legal instruments concerning land use and occupation, Federal Law n. 6.766/79 and Municipal Law n. 9.413/1981 relate to land subdivision and Municipal Law n. 11.228/1992 sets out the Works and Edification Code for the Municipality of São Paulo.

This study has observed deficiencies in terms of implementing green areas policies present in the former São Paulo PDE (2002) and contradictions between some land use and occupation and environmental laws, hindering their application with a view to protecting the environment, a factor already discussed by some authors such as Philippi Jr and Bruna (1998), Silva Filho (2005) and Sepe and Pereira (2012).

For example, a study carried out by the Municipality of São Paulo's Environmental Planning Department, part of the Secretariat for Green and the Environment (SVMA), which mapped Permanent Protection Areas (APPs) containing watercourses, shows that

APP areas in São Paulo make up approximately 269,000 m². These areas are protected by the Forestry Code. However, most APPs have currently been divided into land plots or are built on - which may or may not comply with urban planning legislation, but do not conform to environmental legislation (PEREIRA *et al.*, 2011).

Economic Instruments

Economic instruments for managing green areas must encompass both public and private green areas, given both categories are included within the municipal Green Areas System.

Some discount mechanisms are already provided for in the Buildings and Land Urban Tax (IPTU). For example, Municipal Law n. 10.365/87 provides for a fiscal incentive for properties covered in tree vegetation, described as permanent or perpetuated preservation in the Forestry Code. However, it is thought that economic instruments geared to the preservation of private green areas need to be strengthened.

In this context, article 158 of the 2014 PDE incorporated a mechanism for paying landowners or holders of urban or rural properties for environmental services provided. This is a payment - monetary or otherwise - to landowners or holders of areas who maintain, re-establish or recover the ecosystem services in their lands.

With regard to public green areas, article 43 of the 2014 PDE establishes that "a revision of the land use, occupation and subdivision legislation could incorporate urban planning incentives to include landowners who donate to the municipality areas needed to expand roads and green areas systems".

Another economic instrument exists to create public green areas, based on environmental compensation processes. Environmental compensation can occur in two different ways: it can be associated to the environmental licensing process for activities which cause significant impact or it can occur through vegetation management. This mechanism has allowed for the expropriation of areas to set up parks and green areas. An example is the environmental compensation related to the building of the southern stretch of the São Paulo Rodoanel (ring road) whose main objective is to re-organize the transport of freight in the Metropolitan Region of São Paulo (RMSP) and subsequently enabled the creation of four natural municipal parks.

Administrative Mechanisms

The SVMA is the municipal body responsible for planning, organizing and co-ordinating activities to protect the environment in the Municipality of São Paulo. It defines the criteria for limiting environmental degradation and pollution. The secretariat is currently divided into departments which have specific environmental responsibilities including the Department for Parks and Green Areas (DEPAVE). Park management is carried out by SVMA, whereas the management of other green areas, such as squares and roadside verges, are the responsibility of each ward, under the Municipal Secretariat for the Co-ordination of Wards.

Although a technically qualified team is considered essential for the appropriate planning and management of green areas (PHILIPPI JR e BRUNA, 1998), the interviews analysed revealed that despite the presence of qualified and committed specialists, many positions are politically defined. This could result in a loss of technical capacity every time there is a change in the administration, as well as in the prevalence of less qualified staff.

With regard to the funding available for the management of green areas, the following stand out: the Special Fund for the Environment and Sustainable Development – (FEMA[i]) and the Urban Development Fund – (FUNDURB[ii]), both of which are funded by financial contributions and are crucial for the acquisition of areas for the creation of parks.

Interviewees stated that financial resources held by FEMA and FUNDURB enabled the acquisition of sites for creating green areas in recent years and that most of the money used for expropriation came from tree felling, that is, from environmental compensation.

More recently, when the 2014 PDE came into force, the Municipal Fund for Parks was set up. It should be integrated with and complement FEMA - Special Fund for the Environment and Sustainable Development - whose resources are used exclusively for acquiring private property for implementing parks, according to the planning set out in the PDE[iii].

Institutional Mechanisms

The participation of society in the decision-making process is also considered essential for municipal environmental management and, more specifically, green areas management. Braga (2001) highlights the importance of creating collegiate bodies at the local level such as the Municipal Environmental Councils (and other forums), providing the necessary structure for urban participatory management. Participatory mechanisms are essential for transparency in urban policy, given that lack of transparency may be one of the causes of poor public management. Participatory tools such as environmental councils were cited by interviewees as valuable spaces for the involvement of the population.

In the Municipality of São Paulo, social participation is institutionalized through the Municipal Environmental and Sustainable Development Council - CADES, a consultative and deliberative body addressing preservation, conservation, protection, recovery and improvement issues relating to the natural, built and work environment. There are also other councils such as the Municipal Parks Management Council. In this context, most interviewees cited the mobilization and participation of society as a positive force for expanding the availability of green areas in São Paulo. However, it seems that despite existing structures, civil society participation only occurs on an ad hoc basis and needs to be strengthened. For example, interviewees stated that few people want to participate in environmental councils, or that participation is hindered by a belief that it will not lead to real benefits or because of a lack of time to devote to the participatory process.

Regarding the existence of sectorial agreements, the Municipality of São Paulo has participated in local government international networks on climate change such as the

ICLEI Local Government for Sustainability, through programs such as Cities for Climate Protection (CCP) and the Cities Climate Leadership Group (C40).

In relation to private sector participation in service provision, practices such as public-private partnerships have been encouraged by the 2002 PDE and may be used, for example, to obtain financial resources to develop, manage and maintain green areas. Nevertheless, in practice, these partnerships occur on an ad hoc basis and need to be enhanced, at least in terms of green areas.

Interviewees criticize these partnerships in that they only seem to take place in privileged areas where there is visibility and only produce good results when there is monitoring. Thus, the greater the visibility, the more interesting these partnerships become to businesses. Companies do not usually adopt areas that do not offer immediate financial returns. For this reason, the potential for public-private partnership is deemed limited. According to Coelho (2008), the areas which are less attractive to the private sector are precisely those that need greater input and financial investment, such as parks in peripheral areas.

Finally, inter-sectorial integration was observed in relation to the Riverside Parks Program. In São Paulo, areas surrounding rivers and streams are frequently illegally occupied, in particular by favelas. Urbanization and sanitation activities are usually pursued in these cases. Measures very often involve the removal of low-income population from areas requiring preservation in order to recover the banks of water bodies and move the population out of risk.

Local environmental recovery should occur hand-in-hand with local urban recovery, requiring joint action from the SVMA, the Housing Secretariat (SEHAB) and the São Paulo Basic Sanitation Company (SABESP) through measures such as "100 Parks for São Paulo", the "Priority Micro-basin and Complementary Favela Program" and the "Clean Stream Program". However, a study by Travassos (2010) shows that, in practice, joined-up actions have been inefficient. There is lack of integration between interventions, causing discrepancies between the programs.

Riverside parks are often created in areas with no precarious housing. In addition, there is no direct association with environmental sanitation. Therefore, they frequently end up bordering polluted and degraded rivers (TRAVASSOS, 2010). In other cases actions are well integrated but families removed from the area to be recovered receive compensation which is far below property market prices (LUZ, 2013). The result it that families are likely to migrate to other illegally occupied and environmentally fragile areas.

Green areas planning

Environmental planning of green areas in São Paulo is structured into plans, programs and projects. The São Paulo Strategic Master Plan PDE (2014) contains green area policies defining objectives, directives and strategic actions to ensure the expansion of the Municipality's Green Area System and its appropriate maintenance. Programs such as the "100 Parks for São Paulo" have been implemented. Its aim is to increase the number of parks (urban, riverside, reserves) by the end of 2012. The "Adopt a Square" program

encourages citizens and private organizations to maintain squares. Other positive actions which stand out are the government's efforts in acquiring areas at the edge of the city to turn them into parks and protected areas (by creating an area bank).

However, the analysis of the planning process revealed it is still deficient and the creation of new areas has been too influenced by politics and opportunism. According to interviewees, no plans were conceived to allocate green areas using criteria such as prioritizing their implementation in areas affected by floods or heat islands, generally found in areas of greater density, or used as the basis for landscape planning, as happens in Germany, a country which has a Federal Nature Conservation Law. German legislation provides for the protection of natural resources and landscapes in inhabited and uninhabited areas by recognizing their intrinsic value and importance as a basic human need, also encompassing the protection of green areas. According to German law, landscape planning is an important instrument and a duty of local and regional governments. Another important factor is the relationship between Landscape Planning and Urban Planning. According to the general principle of balance between public and private interests imbedded in the Federal Urban Planning Law, when new urban development plans are defined landscape planning must be considered and taken into account as an issue of environmental public interest. According to German legislation, an imbalance between different interests may make a particular urban development plan void - a significant impediment to future buildings in relevant areas. German law sets out another mechanism which, when strategically used, provides indirect support to the protection of green areas: a requirement to avoid, whenever possible, not only any significant and lasting intervention on the natural environment and landscape, but also any degradation of ecosystems and landscapes. Adverse effects must be prevented if there are reasonable alternatives in order to achieve the aims of the intervention in the site, causing as few adverse effects to the natural environment as possible. When this is not possible, a justification must be presented.

The German example prompts us to reflect on the urban and environmental planning of São Paulo in order to achieve a better balance between different uses. Furthermore, Limnios and Furlan (2013) analysed the spatialization of the São Paulo urban parks created until 2012. They noted the irregular distribution of park types and their areas of influence in São Paulo. There is a greater concentration of parks in the West, Centre and Centre-South regions of the city respectively, to the detriment of other areas. The authors concluded that the spatial distribution of parks is the reflection of a chaotic territorial policy in which the functionality of different types are not well considered when urban parks are created.

In addition to poor green areas planning, actions remain concentrated on creating spaces instead of protecting private green areas. Some interviewees strongly defended protection as a priority strategy and criticized a conception in which urban planning is directed more toward the development of new green areas. Established areas could be protected through acquisitions by local government or by providing financial incentives to private owners through mechanisms such as payment for environmental services, already set out in São Paulo Municipality's Climate Change Policy (Municipal Law n. 14.933, 5 June 2009) and São Paulo Municipality's Strategic Master Plan approved in 2014.

With regard to the adoption of the green areas system concept, an essential factor in the effective spatial planning of these areas, the 2014 PDE and previous master plans had already defined a Municipal Green Areas System, considered in both the 2002 and 2014 plans as an element for integrating the São Paulo urban landscape.

The analysis of green areas policies and the system set out in the 2002 PDE revealed the need for a revision, including a better definition of the categories making up the system, as well as their specific roles. According to Bonduki and Ferreira (2006), the 2002 PDE did not define or map out the so-called Green Areas and the Green Areas System. Although objectives, directives and strategic actions were laid out, they were neither clearly defined as a structured, connected and continuous system, nor were their relationship with the urban fabric considered.

On the other hand, although the current 2014 PDE did not describe each component of the green areas system and their role in detail, these were more comprehensively described, becoming known as the Protected Areas, Green Areas and Open Spaces System. In this system, the creation of a Municipal Plan for Protected Areas, Green Areas and Open Spaces was proposed to include, amongst other factors, the definition of the different classifications of green areas and open spaces. It also set out a policy for these spaces. Moreover, it proposes a Municipal Conservation and Recovery Plan for Areas Providing Environmental Services, a Municipal Plan for Tree Planting in Urban Areas and an Atlantic Rainforest Municipal Plan. In addition, some system components are described in more detail, such as Permanent Preservation Areas (APPs), cemeteries and riverside parks.

Given that each part of a green areas system has a specific role and that there is variation in terms of the conservation and usage of more intensive uses, it is important that each category is more clearly defined, taking into account urban situations and different roles. This is to facilitate the definition of use and occupation parameters allowed for each category, as well as to establish the priority categories for implementing green areas or integrating new areas to the system (Bonduki and Ferreira, 2006).

Furthermore, the Municipal Secretariat for Development, SMDU, points to a lack of joined up efforts between sectorial policies as an implementation failure of the municipal green areas system. Nevertheless, it is important to stress that a few joined-up actions have enabled the creation of green or permeable areas based on urban policies. The Works Code (Municipal Law n. 11.228/92), for example, defines an environmental criterion for occupying land plots, that is, it introduces a minimum land surface permeability ratio of 20%.

Furthermore, the 2014 PDE environmental policy - differently from the 2002 PDE environmental policy which is presented in a separate chapter and not integrated with other sectorial policies, making its adoption difficult - is laid out as a cross-cutting policy, integrated with various other policies, systems and economic development strategies (Art. 193). Urban planning is the activity that defines the long-term use and occupation of land (such as residential, commercial, mixed or industrial use). It, therefore, defines the potential loss of green areas and environmental functions. Thus, it is essential to analyse how and to what extent issues relating to the sustainable management of land are effectively integrated into urban development plans and policies.

The German Urban Plan Federal Law, for example, uses a common model to include environmental protection and climate issues in urban development plans. This legislation focuses on the principle of balancing public and private interests. Issues involving the environment, climate protection and the management of green areas must be assessed and considered during the urban planning process.

With regard to the implementation of the PDE in São Paulo, the analysis of the 2002 plan revealed that despite the fact that it was an improvement in comparison with previous plans, many of the proposed strategic actions did not occur or were only partially carried out. Similarly, urban planning instruments which could have potentially been used to benefit green areas, such as the Building Rights Transference and Pre-emptive Rights, were neither properly regulated nor applied. With the enactment of the new 2014 PDE, the implementation and effectiveness of instruments set out and actions proposed must be studied over time.

Sepe (2013) shows that from 2005, the SVMA administration laid out a new rationale for implementing green areas. By using indicators, important tools for quantifying and assessing the benefits and distribution of green areas in the city, it was possible to clearly see that, indeed, some areas did not have any green spaces. In 2002, the city had 31 parks distributed among 17 wards, a total of approximately 14.5 million m^2. From 2003 to September 2012, 55 new municipal parks were created, reaching a total of 87 parks and 25 million m^2 (SMDU, 2012).

However, the current mapping system of green areas and vegetation cover still make a detailed analysis of its historical evolution difficult, given that they were drawn using different methodologies and scales, hampering any comparison over time of the loss of vegetation and land use and occupation.

Within this context, Nucci and Cavalheiro (1999) argue that the classification and the quantification of green spaces in cities is a challenge, given that problems relating to the definition of terms associated with the quantification of vegetation make it difficult to propose more precise criteria which could assist in the drafting of new legislation to protect the quality of life of the urban population. Furthermore, interviewees stated that no detailed vegetation mapping had been conducted or updated. These are indispensable for planning green areas.

Another planning activity, environmental control, was classified as regular. In 2005, the Water Protection Operation was set up by the SVMA and the Secretariat of Urban Security and included the participation of the Housing and the Wards Secretariats. The aim of this initiative was to protect, control and recover areas of public or environmental interest and water sources. However, findings show that the control of illegal occupation and deforestation is still deficient. In this context, Mello-Théry (2011) highlights that although there are legal instruments available, different actors ignore the law because they know that the control and inspection conducted by the competent public authorities are not sufficient to keep up with territorial changes.

The continuous uncontrolled expansion of urban areas in São Paulo is a reality which reveals, amongst other aspects, the inadequate use of urban policy mechanisms. The development of the urban space still adopts the logic of the property market which prioritizes the private over the public, instead of balancing both interests.

In Germany, the objective of the Federal Policy for Safeguarding Areas is to reduce the use of green areas for residential and commercial purposes to 30 hectares/day by 2020 (the use of these areas in 2013 was 74/day)[iv]. Many German states aim to reach this target with public policies and stakeholders networks whose aim is to reduce the urban occupation of green areas and prevent consequent urban expansion. States such as *Baden-Wuerttemberg, Bavaria* or *Northrhine-Westphalia* set out incentive and economic support programs so as to enable urban residential and commercial development by using and reusing the internal potential of urban centres. This involves making potential use of contaminated industrial and commercial sites, and abandoned public areas (such as railways), an increase in the density of previously developed areas, as well as using the empty spaces between buildings. In this way, city planning makes full use of the urban potential to re-use areas whenever possible to limit the loss of green areas.

The summary of the analysis model results involving the green areas management instruments in the Municipality of São Paulo has a "status" column which graphically shows whether the elements in the model were applied in the municipality in a satisfactory or regular way. There were no occasions when instruments were not applied (Chart 1).

Generally speaking, it can be observed that, in the Municipality of São Paulo, all green areas management instruments have been applied to some degree. However, most are deficient in some way and are therefore classified as "adequate". Only five management aspects were considered to be fully satisfactory: environmental legislation at all three levels of government, the existence of a Municipal Environmental System, the existence of adequate institutional structure, the existence of financial resources allocated to the management of green areas and the integration between municipal governments.

Chart 1 - Green Areas management instruments for the Municipality of São Paulo[v]

Green Areas Management Tools		Management of green areas in São Paulo	Status
Legal	Environmental Legislation at the three levels of government	- Existing.	
	Master Plan	- Strategic Master Plan for the Municipality of São Paulo (Municipal Law 13.430/2002 and Municipal Law n. 16.050/2014). - Inadequate implementation of the plan's green areas policies. - Lack of integration between environmental and sectorial policies.	
	Land use and occupation legislation	- Existing. - Contradictions between urban planning and environmental laws.	
	Municipal Environmental System	- Existing bureaucratic structure. - CADES (Environmental Council) - FEMA (Environmental Fund)	
Economic	-	- Poor incentives for private landowners. - Existence of instruments such as Payment for Environmental Services and Environmental compensation.	
Administrative	Structure (secretariats, departments, etc.)	The Environment and Green Secretariat and departments.	
	Qualified Technical staff	- The existence of qualified staff - Excessive number of political positions.	
	Financial resources	- Funds such as FEMA, FUNDURB and the Parks Municipal Funds.	

Institutional	Participation of society in environmental councils	- Existence of councils - Civil society associations exist, but they are ad hoc.	
	Environmental education	Factor not addressed by this study.	-
	Implementation of the Local Agenda 21.	Analysed in its own section	
	Municipal government associations	Participation in the ICLEI and the C40	
	Participation of the Private Sector	Ad hoc initiatives in public-private partnerships	
	Integration between sectors	- Existing, but lacking.	
Green areas planning	Green areas planning	- There are planning actions (e.g. areas bank, for creating green areas). - Existence of programs and projects (e.g. Program 100 Parks for SP). - Planning is deficient. The creation of new areas is opportunistic. - Priority given to the creation of green areas, instead of protecting private new areas.	
	Adoption of the green areas system conception	- This concept is part of both the current 2014 PDE and the previous 2002 PDE - The current system includes Protected Areas, Green Areas and Open Spaces, as well as the drafting of specific plans - In practice, there is a lack of a systematic vision	
	Environmental information	- Both public green area indices and the vegetation cover indicator are quantified. - There is no detailed or updated mapping of vegetation. - Difficulty in comparing existing data.	
	Environmental Control	- Control of illegal occupation and deforestation is deficient. - Creation of the Water Protection Operation	

Source: developed by the authors.

Caption:  Satisfactory.  Adequate.

Implementation of the Local Agenda 21 - chapter on green areas

The Local Agenda 21 is a strategic planning instrument which represents the commitment of the Municipality of São Paulo to sustainable development. Therefore, although it was produced in 1996 it is a long-term mechanism expected to last at least 20 years.

It is difficult to directly attribute to the objectives of this Agenda the proposed and/or planning actions which have occurred since 1996. However, Agenda 21 is considered to be not only a reference for the proposed analysis, but also an environmental management institutional instrument.

This analysis was carried out by verifying the compliance with objectives found in the document's specific chapter which describes the means for implementing an effective and sustainable green areas system.

Neither environmental education nor the creation of instruments to expand the archive of public properties to implement social facilities have been considered in this study.

The objective related to drafting a policy for using public and private land plots for expanding and maintaining green areas in the Municipality was adequately achieved. The 2002 PDE defined the adoption of the urban policy instruments contained in the Statute of the City to green areas. Some of these instruments were adequately adopted. However, most are in need of regulation or have not been adequately applied, as already mentioned.

The second objective sets out a public agreement between the Executive, the Legislative and organized civil society in order to implement the proposals agreed and defined in accordance with the priorities jointly defined with the population. It also establishes the revision and expansion the Municipality's Green Areas System. Accordingly, the Municipality's Green Areas System was revised and improved in both the 2002 and in the current 2014 PDE. However, there are many restrictions affecting the expansion of the Green Areas System, as previously observed.

The third objective relates to the preservation of all significant vegetation formations - forest, shrubland, wetlands, fields, riparian vegetation and rainforest - in order to guarantee a genetic bank with scientific exploration potential for projects to recover degraded areas and expand natural green areas. The objective regarding the different vegetation types in the municipality has been partially attained. New nature reserves were recently created in the municipality which could be considered an advance. A new vision is emerging relating to biodiversity and vegetation types which had almost disappeared with the growth of the municipality which are now receiving more attention from local government. According to interviewees, experts' views have changed and now incorporate this issue in green areas projects. Nevertheless, it is important to expand mechanisms for protecting different vegetation types in the municipality.

The objective to improve the current rate of public green areas per inhabitant was attained. In recent years, the ratio of public green areas per inhabitant has increased, although not significantly (from 11.58 m^2 of green areas per inhabitant in 2008 to 12.50 m^2 of green areas per inhabitant in 2011 (SVMA, 2011), as a result of actions such as the 100 Parks for São Paulo Program. However, other indicators reflecting other facets of the green areas and their distribution in the city must also be considered.

On the other hand, the objective relating to improving the existing monitoring system to guarantee the maintenance of privately owned plots of lands and other sites with significant amounts of green areas has not been reached, at least for now. Although a system for paying for environmental services was proposed in the 2014 PDE and the SVMA started a register of owners with properties on the border areas of the municipality, few concrete actions have been taken to incentivize private green area owners to maintain them. The only exception is the IPTU discount for properties covered in trees and described as permanent or perpetuated preservation areas, according to the Forestry Code.

There have been some improvements regarding proposals to promote the better management of public green areas and tree planting on thoroughfares, including the diversification of species. Despite improvements related to the implementation of programs such as "Square Carers" and "Adopt a Square", the management of green areas is still deficient, for example, there is a lack of medium and long-term planning in terms of vegetation, a lack of park management planning and bidding processes are steered by the lowest costs, affecting the viability of good projects.

Many areas which should have been destined for the implementation of public green areas, in accordance to Municipal Law n. 9.413/1981 governing land subdivision, were used for other purposes such as illegal housing. Despite these issues, the implementation of the 100 Parks for São Paulo Program has been driving actions such as the establishment of an area bank and the issuing of Public Utility Declarations (DUP) for various areas in the municipality. Thus, the eighth objective was partially attained. This objective aimed to ensure that green areas are implemented in plots set aside for this purpose which are at risk of causing irrecoverable damage to the existing patrimony and compromising soil permeability, the micro-climate, as well as air, flora and fauna quality.

The aim of the next objective is to expand technical, legal and administrative mechanisms to ensure the appropriate occupation of land from an environmental, urban planning and social perspective, enhancing procedures to guarantee the compliance of legislation. It was partially attained. As previously mentioned, there are contradictions between environmental and urban planning legislation (for example, Municipal Law n. 11.228/1992 on the Works and Edification Code), particularly in relation to APPs in urban areas. Most APPs are currently occupied by plots and buildings which may be either legal or illegal according to urban planning legislation, but which do not comply with environmental legislation (PEREIRA *et al.*, 2011).

The interviews analysed revealed that there is potential for "green marketing" to stimulate businesses to conserve green areas in their establishments. This related to the objective of encouraging the business sector to implement ventures taking into account the conservation of green areas in return for urban planning or fiscal benefits. However, no mechanisms such as the granting of urban planning or fiscal benefits have been identified.

The last objective proposed foresaw the drafting of a specific plan for implementing green spaces to recover degraded areas in the municipality. Riverside parks were created and implemented along river courses and the bottom of valleys in municipal areas which were often illegally occupied.

Therefore, out of the 12 objectives proposed by the Local Agenda 21, only one was satisfactorily attained. Seven were partially attained, two were not attained and two were not addressed by this study. It is important to observe that this analysis was based on the results obtained in this study. Therefore, they were based on the universe of topics and data discussed here.

Taking into account the economic, social and environmental dimensions of sustainability, it can be observed that the objectives proposed by Agenda 21 mainly relate to social and environmental factors. Four of the objectives are strictly related to the environmental dimension and only two fall within the economic dimension. This shows that economic factors are not a priority for the Agenda 21 green areas chapter. These were the only two objectives not attained.

Conclusion

This study considers that the sustainability tripod has been weakened in terms of green areas management in comparison to the objectives proposed by Agenda 21. When the perspective is expanded to include good management practices for green areas as framed in the analysis model, economic instruments are found to be fragile, despite being supported by environmental compensation mechanisms and the inclusion of payment for environmental services in the 2014 PDE.

Both the environmental and social dimensions of sustainability have been more strongly incorporated in the management of green areas. There are mechanisms which enable the adoption of green areas management instruments to differing degrees. However, it is still essential to improve the use of these instruments and work toward attaining the objectives proposed by Agenda 21 to a satisfactory level. In addition, it is also important to strengthen the economic aspects of this management, in particular the relationship between the creation of incentives and subsidies for private landowners and business people to conserve existing green areas.

One of the most significant restraints is inadequate planning, often opportunistic and not promoting a systematic understanding of green areas in the city which would enable a more integrated vision of the local demand for such areas. Another important obstacle is the priority given to the creation of green areas in detriment to the protection of areas already in existence, especially in privately owned land. Within this context, there is a good potential, so far disregarded by the municipal administration, for implementing incentive mechanisms for private landowners.

Finally, it is important that the municipal authority steers its actions so that management changes do not imply a discontinuity of activities which may, as a result, compromise the adoption of sustainable development principles.

Notes

i FEMA was established by Law n. 13,155, 29/06/2001 to support projects involving the sustainable use of natural resources, the maintenance and improvement and/or recovery of environmental quality and research, as well as environmental control, monitoring and protection. It relies on funds from increased budgetary resources, often the result of breaches of environmental legislation, donations, in addition to income from contracts, consortiums and agreements, terms of co-operation, financial compensation due to mineral exploration and damages, Specific Environmental Agreements, Conduct Adjustment Agreements as well as income from the use of public spaces and carbon credit revenues.

ii FUNDURB resources, set out in the 2002 PDE, derive from a variety of sources, including income from financial contributions as a result of payments for granting additional building allowances which are applied based on urban and environmental objectives, directives, plans, programs and projects part of, or a result of, the Strategic Master Plan included in the Municipality's Target Program, of which it is important to highlight the creation of green areas, riverside parks and conservation units.

iii PDE (2014) - Article 289, paragraph 4: Municipal Fund for Parks resources will come from: I - specifically targeted increased budgetary resources; II - additional supplementary credits; III - the expropriation of municipal public areas; IV - donations from both individuals and businesses; V - donations from international organizations; VI - agreements, contracts, consortiums and covenants; VII income obtained from investment of own assets; VIII fiscal incentives; IX - any other revenue.

iv http://www.bmub.bund.de/themen/strategien-bilanzen-gesetze/nachhaltige-entwicklung/strategie-und-umsetzung/reduzierung-des-flaechenverbrauchs/

v The data shown on the table are the results of the bibliographical research and interviewees' views.

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THE MANAGEMENT OF GREEN AREAS IN THE MUNICIPALITY OF SÃO PAULO: ADVANCES AND LIMITATIONS

AMANDA SILVEIRA CARBONE
SONIA MARIA VIGGIANI COUTINHO
STEPHAN TOMERIUS
ARLINDO PHILIPPI JUNIOR

Abstract: In a scenario of urban expansion and precariousness, urban green areas act as mitigators of environmental and health problems. The aim of this research is to analyse the management of green areas in the city of São Paulo and advances in terms of sustainability. The research involved a literature review, documental research, interviews with the key actors and an analysis model. The government possesses the institutional and legal structure to undertake environmental actions and there is funding and mechanisms to enforce social participation. In the last decade there have been several advances relating to green areas, such as the creation of new parks. However, planning procedures need to be strengthened. In addition, there must be monitoring of actions taken and incentives must be created so that private green areas are maintained. Stronger integration of the green areas policy with other urban policies is needed, as is the case in countries such as Germany.

KeyWords: urban green areas, management, public policy, planning.

Resumo: Em um cenário de expansão e precariedade urbana, as áreas verdes agem como atenuantes dos problemas ambientais e de saúde. Considerando a importância da gestão ambiental para a qualidade ambiental, objetiva-se analisar a gestão de áreas verdes no Município de São Paulo e seu avanço em direção à sustentabilidade, através de levantamento bibliográfico, pesquisa documental, entrevistas com atores chave e estruturação de modelo de análise. O poder público possui estrutura institucional e legal para empreender as ações de comando e controle ambientais, existem fontes de financiamento e mecanismos para efetivar a participação social. Na última década houve avanço em relação à gestão, com a criação de novos parques. No entanto, é importante que haja fortalecimento do processo de planejamento, ampliação da fiscalização, criação de incentivos para manutenção de áreas verdes particulares e, maior interlocução da política de áreas verdes com outras políticas urbanas, como tem ocorrido em países como Alemanha.

Palavras-chave: áreas verdes, gestão ambiental, políticas públicas, planejamento.

Resumen: En un escenario de inseguridad urbana, espacios verdes actúan como mitigatores de los problemas ambientales. Considerando la importancia de la gestión ambiental para la búsqueda de la calidad ambiental, el estudio trató de examinar la gestión de las áreas verdes en la ciudad de São Paulo y su progreso hacia la sostenibilidad a través de una revisión bibliográfica, investigación documental, entrevistas y modelo de análisis. El gobierno tiene estructura institucional y legal para llevar a cabo las acciones del medio ambiente, existen fuentes de financiación y mecanismos para hacer cumplir la participación social. En la última década se han producido avances, como la creación de nuevos parques. Sin embargo, es importante el fortalecimiento del proceso de planificación, mayor supervisión, creación de incentivos para el mantenimiento de las zonas verdes y mayor diálogo entre la política de espacios verdes con otras políticas urbanas, como se ha hecho en países como Alemania.

Palabras clave: espacios verdes, gestión ambiental, políticas públicas, planificación.