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TEN YEARS OF THE NATIONAL SOLID WASTE POLICY: AN OVERVIEW OF THE CITY OF SÃO PAULO

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Abstract: The present work aims to present the impacts of the ten years of the Law that established the National Solid Waste Policy (PNRS) in the management of Urban Solid Waste (MSW), using the city of São Paulo as a panorama. The research was divided into three stages: exploratory, descriptive and analytical. Indicators separated into 5 groups were used: 1-Generation; 2-Cost and Financing; 3-Productivity; 4- Recycling and 5-Institutional, the first four quantitative groups, analyzed through tables and graphs prepared with raw data from the National Sanitation Information System - Solid Waste (SNIS-RS) and the last with reference to article 19 of the Law Number: 12,305/2010, compared to the Integrated Solid Waste Management Plan (PGIRS) of the city of São Paulo. The municipal plan covers the necessary points addressed in the Law, however, the practice, according to the data analyzed, has been very far from ideal. It is noted that the PNRS Law marks the beginning of a greater visibility and importance to the theme, mainly to the proper disposal, but it is still not very effective in action.

Keywords: National Solid Waste Policy, Recycling, São Paulo, Law.

INTRODUCTION

The National Solid Waste Policy (PNRS) was established by Law Number: 12,305, of August 2, 2010, which amended Law Number: 9,605, of February 12, 1998, taking other measures. The objective of this research is to provide an overview of the management of solid and urban waste in the city of São Paulo since its inception promulgation. For this analysis, we used 34 indicators divided into five categories: 1- Generation; 2- Cost and Financing; 3- Productivity; 4- Recycling and 5- Institutional.

Jacobi and Basen (2011, p.1) state that "one of the biggest challenges facing modern society is the equation of excessive generation and the environmentally safe final disposal of solid waste", since, in addition to the increase in generation, management is not efficient and adequate areas for final disposal are lacking. The PNRS Law, for Jardim et al. (2021, p.54), it represents a positive legal framework "in terms of legal certainty, clarity of guidelines and the vitality of the set of its concepts, principles, objectives and planning and management instruments". Despite the importance of the law, this does not make it immediately executable in all dimensions, but establishes the beginning of a process that brings aspects about solid waste, such as those described in the objectives of the Integrated Solid Waste Management Policy (PGIRS).) from the city of São Paulo, with emphasis on the order: non-generation; reduction; reuse; recycling; solid waste treatment; environmentally adequate final disposal - only of tailings. This project was developed by the research group Public Policies and Dynamics of Territorial Development (PD2T) of the Universidade Tecnológica Federal do Paraná (UTFPR) in partnership with the Observatory of the National Policy on Solid Waste (OPNRS), which developed this methodology. Thus, this article aims to answer the question: How has the PNRS Law impacted urban solid waste management at the municipal level? In this case, the city object of the work was São Paulo.

The objective of the study is to analyze how the city of São Paulo has managed its Urban Solid Waste (MSW) in recent years, as a result of the PNRS Law, through proposed indicators, with data collected from the National Sanitation Information System - Solid Waste. (SNIS-RS), and thus serve as an instrument for discussion on the current situation of the implementation and operation of the law in the capital. The data collected in the SNIS-RS are from the years 2008 to 2019 in the city of São Paulo for a longitudinal analysis and from

the most recent year - 2019 - from three other capitals for a vertical comparison. (SNIS-RS, 2021). These were chosen because of the population size that most resembled the city of study and that had data available, respecting the limit of up to 30% of variation for more or less. Thus, the cities for comparison with São Paulo used in this research were: Brasília, Rio de Janeiro and Salvador. This article is divided into 4 sections, including this introduction. The second section deals with the applied methodology, the third with the results and, finally, with the conclusions.

METHOD

An exploratory research was carried out (to point out and develop in-depth questions), descriptive of the data collected and worked on graphs and analytics for the composition of the evolution of the indicators. The preparation of this study took place through quantitative analysis based on secondary data from the SNIS-RS, from 2008 to 2019. These data served as the basis for the construction of tables and graphs according to the needs of the 15 quantitative indicators of the analysis groups, each indicator being generally composed of a graph with data from the city of São Paulo from the years 2008 to 2019 and a graph with data from 2019 both for the city of São Paulo and for the cities taken as a parameter: Brasília, Rio de Janeiro and Salvador.

Group 1 concerns "Generation", composed of two indicators: the amount of waste produced per inhabitant per day and the origin of the waste collected (household and public). Group 2 is about its "Cost and Financing", which took as a criterion: source of resources for waste management (civil society collection or state participation); type of collection (origin); per capita cost of urban cleaning; self-financing rate and cost per ton. Group 3 brings "Productivity" measures, for which the

following were required: number of inhabitants served per worker; average amount of waste collected per worker and average amount of waste collected per cooperative member. Group 4 is "Recycling" and measured: the percentage of recycled collected waste; reuse rate of collected recycled waste (percentage of collected waste that is reused); composition of the total material recovered; average number of members per entity in the area and number of entities. Group 5, "Institutional", did not use graphics with data from the SNIS-RS, but is the result of a qualitative analysis of the PGIRS of the municipality of study, therefore, its 19 indicators were based on the 19 items present in article 19 of the Law Number: 12,305/2010.

After the development of graphs for each indicator, they were analyzed and classified according to signaling indices from 1 to 3, where 1 - worsened or remained unchanged; 2- partially improved; 3- improved the status of the indicator.

RESULTS

When analyzing the Integrated Solid Waste Management Plan (PGIRS) of the city of São Paulo in the light of article 19 of Law Number, 2010), listed in items XIX, the municipality is in line with practically all the requirements of the theory (16), being partial (score 2 in the indicator) in relation to three of them: item XII, on income generation; item XVIII, on environmental liabilities and XIX, regarding the updating of the plan.

The quantitative analysis used raw data from the SNIS-RS for the elaboration and construction of tables and graphs in order to verify the progress, divided into 4 groups of indicators already mentioned. São Paulo, in the MSW Generation group, presented positive indicators (grade 3), both in terms of production and the origin of waste. In the average production of waste per inhabitant per day, it was noted that this number over the

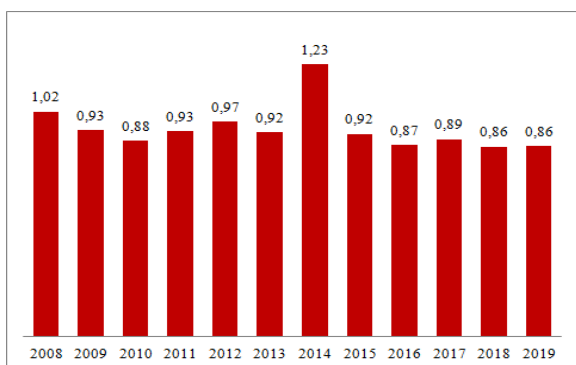years (2008 to 2019) remained stable, with a slight drop in the PNRS year (Figure 1).

Figure 1 - Total waste generated per inhabitant in kg/day - São Paulo - 2008 to 2019

Source: Own authorship (2021)

Compared to the other capitals for comparison, it is possible to observe that the capital of São Paulo has the best value (Figure 2). For the indicator of MSW origin, São Paulo has the highest percentage from households (98%), which is positive, since its value is very close to 100%, stable and probably within the realistic limit of this proportion, in addition to having the best index in relation to similar cities in population.
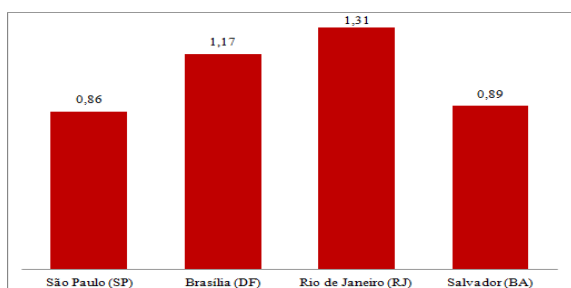

Figure 2 – Total waste generated per inhabitant in kg/day - São Paulo, Brasília, Rio de Janeiro and Salvador - 2019

Source: Own authorship (2021)

Regarding Cost and Financing, group 2, São Paulo needs to improve, including in terms of recording its data, many of which are missing from the SNIS-RS database. For the indicators that were possible to measure, the capital is below in all three. The indicator in relation to the distribution of expenses by type of collection - in which it is worse to have a higher percentage of expenses coming from public places, because it is more expensive -, São Paulo presented a score of 2. The expense with sweeping public places reduced considerably in the last year (22.8%), from 46.6% to 37.6%, but the rates for the years prior to the PNRS are better than the current ones (2008: 12.1% and 2009: 8.2%), in addition to 2018 show the worst performance of the entire route (2018: 46.2%). As for the per capita cost of urban cleaning, São Paulo scored 1, since its cost has increased and is among the worst years in the capital, in addition to being the second most expensive city in the comparison. The last indicator in the group refers to the cost per ton, in which the city scored 2. The capital of São Paulo has had gradual declines in its cost in recent years, although, compared to other municipalities, it is the second highest (Figure 3).
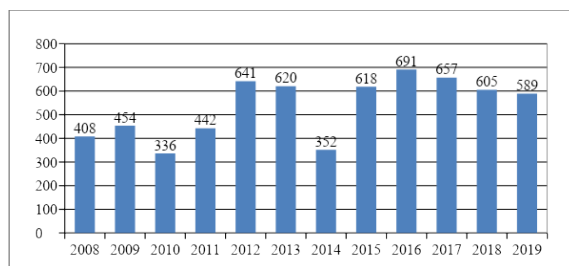

Figure 3 – Cost in BRL per ton collected per year at 2019 prices – São Paulo, from 2008 to 2019

Source: Own authorship (2021)

To analyze the productivity of the city of São Paulo, three indicators were analyzed. The first refers to the number of inhabitants served per worker. In this regard, the capital is in years of low productivity compared to its own numbers, with an increase from 2018 to 2019

of less than 1%, from 697 to 702 inhabitants served per worker. Despite the modest increase, São Paulo has the best productivity in relation to capitals of similar population size - São Paulo had, in 2019, 702 inhabitants served per worker; Salvador 614; Brasília 639 and Rio de Janeiro 303 - their score being 2 for the indicator. For the other two productivity criteria, São Paulo does not present good numbers. The average amount of tons of waste collected per worker has been declining in recent years, with 2019 (with 696.4 Ton/worker/year) being better only than 2008 (with 465.1 Ton/worker/year). The amount of tons that each member collects is low compared to previous years, but the second best compared to other cities, even though their values are more subtle – São Paulo: 31.83 Ton/member/year ; Rio de Janeiro 33.67; Salvador 29.10 and Brasília 22.96. (SNIS, 2021).

The issue of Recycling is analyzed in 5 indicators. The first deals with the percentage of recycled collected waste. São Paulo had a slight recent decline (it already had 2.5% in 2014) and in 2019 this percentage rose again (2.1%), it has a number behind Brasília (which has 2.5%), but much better than the numbers presented by Rio de Janeiro (0.5%) and Salvador (1.5%). The second indicator, on the reuse rate of these collected waste, was not good numbers for São Paulo, which has been showing successive drops and even the worst percentage compared to other municipalities (40%), especially compared to Brasília, which in 2019 had 94 % utilization. The composition of the total of this recovered material has varied its distribution and a positive point is that it presents data on their distinction (between paper and cardboard, plastic, metals and glass).

The average number of cooperative members per entity had fallen throughout the decade, but rose again significantly (51.7%) in the last year. In relation to other cities,

São Paulo presents the best numbers in this category – São Paulo 44 cooperative members per entity; Brasilia 37; Salvador 22 and Rio de Janeiro 14. For the number of entities, São Paulo (23) has been in the average of its years of analysis and presents more only than the city of Salvador (15).

CONCLUSION

When observing the municipal plan, PGIRS, São Paulo seems to be in compliance with the Law that institutes the PNRS, with few points of more attention, however, in practice, through the data presented, there is a large gap between the plan theory and waste management practice. While the evaluation indicators of the institutional group were 16 positive and only 3 partial, of the four groups in which data from the municipality were evaluated, only 3 obtained maximum grade (grade 3), 5 partial grades (2), 5 low grades (1), in addition to 2 unfinished due to lack of data from the municipality. Thus, it is possible to observe that the actions proposed in its plan have not been reflected in its numbers, an execution failure that needs to be resolved by the authorities. In the 10 years of the National Solid Waste Policy, there has been a positive impact on theoretical actions and the discussion on the subject is already an advance. However, numerically it is still not very expressive and there is still much to do. Care for the environment, the correct concern with disposal, reduction of "garbage" has gained prominence, even if in practice people find it difficult to perform. It is the role of the state to clarify the population about the actions taken on this front and conduct environmental education campaigns for the reduction and also the correct destination. The theme's demand is urgent, since there is no "throwing away", because there is no "out", everything goes to a destination, which must be the destination that presents the least

environmental impact.

THANKS

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