



**São Caetano do Sul, Brazil and Luanda, Angola: Two realities in urban  
solid waste handling and management**

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## ABSTRACT

The climate emergency is the main environmental issue today. Among other aspects, coping with its effects, implies changes in the way society produces, consumes and disposes of its goods. This research aimed at characterizing and analyzing dry or recyclable Urban Solid Waste (USW) handling and management in the municipalities of São Caetano do Sul, SP, Brazil, and Luanda, in the province of Luanda, Angola, in order to contribute to recognizing challenges and potentialities to qualify this process. This is a case study with a quali-quantitative approach, carried out through a bibliographic review, survey and analysis of secondary data, documentary analysis and field visits with non-participant observations. Data analysis was carried out by triangulating methods. It was found that, even with their geographic, socio-demographic and political-economic specificities, São Caetano do Sul and Luanda have similar recycling indicators. The absence of public policies capable of promoting responsible consumption is also accompanied by lack of planning of urban spaces to promote proper USW disposal by consumers. In both cases investigated, the demand for USW recovery strategies and mechanisms that promote selective post-consumption disposal were evident, in order to benefit reintegration of waste into the production chain. It is hoped that this research can contribute to reflections on the topic, regarding the role of each actor and public policies related to proper urban solid waste handling and management.

**KEYWORDS:** Selective disposal. Waste management. Recycling.

## 1 INTRODUCTION

The climate emergency has been considered the primary environmental issue of our time and, according to Besen and Grandisoli (2015), addressing global warming and its impacts requires profound changes in the way our society produces and consumes. It is fundamental to "reduce unsustainable use of natural resources, improve production, consumption and disposal practices, and maximize waste recovery while appropriately managing rejects" (p. 64).

This is the central theme of this research: Post-consumer household Urban Solid Waste (USW), especially dry and recyclable, in the context of contemporary society and its challenges related to shared responsibility, urban space management and sustainability.

In this article, characteristics of the locations selected for this study are surveyed and analyzed, namely: São Caetano do Sul, state of São Paulo, Brazil; and Luanda, capital city of the province of Angola. A parallel will be drawn between geographical, sociodemographic, political and economic aspects. Regarding dry or recyclable waste generation, handling and management, legal aspects and specific challenges for each location in terms of Urban Solid Waste (USW) collection, transportation, disposal and their respective public policies will be outlined, without the intention of making direct comparisons.

According to the International Solid Waste Association (ISWA), it is estimated that 25 million tons of solid waste find their way into the world's oceans every year. Approximately 80% of this total comes from human activities on the continents, whether on the coast or in regions with rivers that flow into marine environments, resulting from failures in urban cleaning systems and waste management in urban areas of cities (ISWA, 2021).

It is no different in Brazil, since, according to ISWA estimates (2021), the country is annually responsible for nearly 2 million tons of solid waste that travel long distances through rivers to reach the oceans. Drawing a parallel with Angola, the rainwater drainage channels in the province of Luanda, known as ditches or rivers and that should exclusively carry rainwater,

also carry sewage and hundreds of tons of waste indiscriminately discarded into these channels, which ultimately flow directly into the Atlantic Ocean.

In this context, the objectives of this research are presented below.

## 2 OBJECTIVES

To characterize and analyze dry or recyclable urban solid waste management in the municipalities of São Caetano do Sul, SP, Brazil, and Luanda, province of Luanda, Angola, in order to contribute to recognizing challenges and potentialities for qualifying this process.

## 3 METHODOLOGY

The current research was conducted using the case study method, which, according to YIN (2015), involves empirical investigation into a specific phenomenon or contemporary situation, taking into consideration the context of the reality under study.

Using a quali-quantitative approach (KAUARK, MANHÃES and MEDEIROS, 2010), data collection was conducted through a literature review in electronic databases searching for secondary data. Documentary analysis was also performed in sources that included the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística, IBGE) and the National Sanitation Information System (Sistema Nacional de Informações sobre Saneamento, SNIS) for data on Brazil, São Paulo and São Caetano do Sul. In the case of Luanda (province and capital city), academic papers, the latest census conducted in 2014 by the National Institute of Statistics (Instituto Nacional de Estatística, INE), the Angola Social Report for 2012 and 2013, surveys conducted by the Mobizno waste consulting firm contracted by the Japan International Cooperation Agency (JICA) Angola, the Strategic Plan for Urban Waste Management (Plano Estratégico para a Gestão de Resíduos Urbanos, PESGRU), and non-participant observations with the use of field notes were employed. These observations were carried out during visits to the locations by the author-researcher on two occasions: July 2022 and March 2023.

In addition to that, technical reports produced in both locations were consulted, focusing on actions, programs and current legislation of interest for the research. Among them, in the case of Brazil, the National Environmental Sanitation Policy, Federal Law 11,445/2007 (BRAZIL, 2007); the National Solid Waste Policy, Federal Law 12,305/2010 (BRASIL, 2010); the Regional Integrated Solid Waste Management Plan for the Greater ABC Region (CONSORCIO ABC, 2016); and the Municipal Waste Management Plan for São Caetano do Sul (SÃO CAETANO DO SUL, 2013); and, for Angola, the Angola Basic Environmental Law (ANGOLA, 1998).

Therefore, the cases investigated in this research were the cities of São Caetano do Sul, located in the Greater ABC Region, state of São Paulo, Brazil; and Luanda, capital city and province of Angola.

With an estimated population of 165,655 inhabitants (IBGE, 2022), covering an area of 15.33 km<sup>2</sup> (IBGE, 2022) and a population density of 9,736.03 inhabitants/km<sup>2</sup>, São Caetano do Sul is known for leading the Human Development Index (HDI) in Brazil. Furthermore, in July 2022, it started leading the ranking of sustainable cities with a score of 65.62 out of 100, based on the practices related to the United Nations Sustainable Development Goals (SDGs) (IBGE, 2022).

At the other extreme we have Luanda, capital city of Angola, with 1,742,180 inhabitants spread over 113 km<sup>2</sup> (MOBIZNO, 2022). Angola has an HDI of 0.586, ranking 148th among the 191 member countries and territories, whereas Brazil appears in position 87 with an HDI of 0.754 (UNDP, 2022). With an area of 18,826 km<sup>2</sup>, the province of Luanda is the most populous, with 6,945,386 people, accounting for slightly over a quarter (27%) of the country's population (INE, 2014). According to the Saber Geográfico website (2021), the political-administrative division of the province of Luanda was changed in 2011 by the Amendment Law of the Political-Administrative Division of the Provinces of Luanda and Bengo. Thus, in the new administrative division, the province of Luanda went from 9 municipalities to 7 municipalities, namely: Belas, Cacuaco, Cazenga, Icolo and Bengo, Quiçama, Luanda and Viana (ANGOLA, 2011).

Data analysis was carried out through triangulation of methods (SANTOS et al., 2020).

#### 4 RESULTS

It is important to begin the presentation and discussion of the research results by highlighting some terms related to the management of USW used by both countries, which, despite sharing the Portuguese language, present some specific differences, as shown in the following comparative chart (Chart 1).

Chart 1 - Terms related to handling and management of the USW used in Brazil and Angola

Brazil	Angola
Bueiro ou boca de lobo (Storm drain)	Esgoto(Sewer)
RSU – Resíduos Sólidos Urbanos (USW – Urban Solid Waste)	RU – Resíduos Urbanos (UW – Urban Waste)
Container ou caçamba (Container or dumpster)	Contentor (Container)
Ponto viciado (Dumping spot)	Lixeira (Trash bin)
Passarela (Pedestrian bridge)	Pedonal (Footbridge)
Poças d'água (Puddles)	Lagoa(Lagoon)
Sucateiro or armazenador temporário (Scrap storage or temporary storage)	Casa de balança (Weighing house)
Estado (State)	Província (Province)
Bairro (Neighborhood)	Distrito (District)
Vilarejo ou comunidade (Village or community)	Comuna (Commune)
Garrafa PET (PET bottle)	Bidon (Jerrycan)
Rio (captação de água pluvial) [River (rainwater drainage)]	Vala (Ditch)

Source: The authors.

We also begin by presenting some sociodemographic and geographical data for Brazil and Angola, as well as for the cities of São Caetano do Sul and of Luanda, capital of the province of Angola, the two locations investigated in this study, as shown in Chart 2 below.

Chart 2 - Sociodemographic and geographic data for Brazil, São Caetano do Sul, and for Angola and Luanda (capital).

Indicators	Brazil	São Caetano do Sul	Angola	Luanda (capital city)
HDI	0,754(b)	0,862(d)	0,586(b)	-
Population	203.062.512 (c)	165.655(a)	34.503.774(b)	1.742.180(e)
Area	8.515.770 (b)	15,33(a)	1.246.700(b)	113(e)
Density (inhab/km <sup>2</sup> )	23,86 (a)	10.805,23(a)	28(b)	15.417,52*
SDG Ranking	53(d)	-	154(d)	-

Sources: (a) IBGE, 2022; (b) Countryeconomy, S/D; (c) IBGE, 2023; (d) PNUD, 2010; (e) Acervo próprio – MOBIZNO, 2022 \*Densidade calculada



#### 4.1.1 São Caetano do Sul, SP, Brazil

The selective collection of recyclable, organic and non-recyclable waste (rejects) in São Caetano do Sul covers 100% of the municipality (SAESA, 2023). The adopted model is door-to-door collection, in which residents separate dry waste (recyclables) into yellow plastic bags that are placed out on pre-defined days and times, according to the neighborhoods. The recyclable waste is collected and sent to two cooperatives affiliated with the Water, Sewage and Environmental Sanitation System (*Sistema de Água, Esgoto e Saneamento Ambiental*, SAESA): the Cooperative of Collectors and Recyclers of São Caetano do Sul (*Cooperativa de Trabalho dos Catadores e Recicladores de São Caetano do Sul*, COOPETRESC) and Colheitar.

The population living in single-family and small multifamily houses (up to 30 apartments) receive 3 bags of 60 or 100 liters per month at no additional cost. They are also provided with guidance through campaigns and printed materials on how to dispose of their recyclable waste on pre-established days and times.

On the other hand, condominiums, industries and businesses join the selective collection system by submitting written requests to SAESA. For condominiums with more than 31 Apartments, upon request and completion of a registration, SAESA provides a canvas “big bag”, measuring approximately 1 cubic meter, which is removed by recycling trucks (box and cage type) and sent directly to both cooperatives of the city.

It was found that the two cooperatives in São Caetano do Sul collected a total of 1,579,506 kilograms in 2021, averaging 131,626 kilograms per month. Of this amount, 18.9% was rejected during the sorting process and sent to a landfill; in other words, according to Administrative Process No. 2m464/2022, through official channels, the municipality sent a mean of 106,732 kilograms for recycling (SÃO CAETANO DO SUL, 2022).

The reasons for the rejection percentage among recyclables can be attributed to various factors, such as lack of value placed on them by the recycling chain due to a lack of buyers, low commercial value, and/or high complexity of the material to be recycled, contamination from food residues or separation difficulty (small dimensions or low quantities discarded). The following can be mentioned among the types of rejected materials: Expanded Polystyrene (EPS), also known as Styrofoam®, various fabrics, footwear, small plastic items (coffee stirrers, sausage casings, plastic bottle caps, etc.), Biaxially Oriented Polypropylene (BOPP) (metalized packaging), multi-layer or complex packaging (coffee and tomato sauce packaging), toothbrushes and toothpaste tubes, writing materials, batteries, nail polish bottles, etc.

Chart 3 below provides a synthesis based on the data collected in the aforementioned administrative process.

Chart 3 - Synthesis of recyclables collected, rejected post-sorting, sorted and monthly mean sent for recycling, in 2021.

Dry waste collected	Reject post-sorting	Dry waste sorted	Monthly mean sent for recycling
1.579.506,0 kg/year	298.732,0 kg/year	1.280.774,0 kg/year	106.731,17 kg/month

Source: Administrative process 2464/2022

When relating the population estimated by the IBGE in 2022, which is 165,655 inhabitants (IBGE, 2022), to the volume allocated for recycling in 2021 (SÃO CAETANO DO SUL, 2022), we obtain a monthly mean of 106,731.17 kilograms. This results in a per capita mean value of 0.65 kilograms per inhabitant per month or 22 grams of recycled waste per day, which is equivalent to an empty 1-liter PET bottle per inhabitant per day.

It is worth reinforcing that this calculation did not account for recyclables that may have been collected through alternative means, such as individual scavengers and cooperatives from other locations, who collect recyclable waste informally.

Another data source used in this research was the National Information System on Sanitation (SNIS), a tool for collecting and consolidating diverse information about basic sanitation services in Brazil. Among the data collected by the SNIS are details regarding the collection of household solid waste (HSW) and public cleaning waste (PCW), including the average *per capita* mass collected. According to a sample of 1,748 municipalities that use weighing scales, the SNIS calculated an average *per capita* HSW+PCW collection of 1.00 kg/inhabitant/day for the urban population (SNIS, 2020).

Thus, in São Caetano do Sul, in 2021, in a *per capita* relationship between waste generation and collection (1.06 kg) and collection of recyclables (0.022 kg), the municipality allocated 2.07% of the waste collected. According to the SNIS, in 2020, the average *per capita* mass of recyclables recovered was 7.99 kg/inhabitant/year in 1,999 municipalities, which corresponds to 0.022 kg/inhabitant/day (SNIS, 2020). Exactly the same as the São Caetano do Sul index.

As is the case in every municipality with selective collection, recyclable waste is highly sought after by individual scavengers who roam the city in search of these materials. It is no different in São Caetano do Sul, as these individuals conduct open-air sorting, plundering the yellow bags (recyclables) in search of the most valuable waste, oftentimes leaving a trail of rejects scattered for the public cleaning services to collect and dispose of in the landfill. A representative from the National Movement of Recyclable Material Scavengers stated the following in an interview during a live stream in which the author participated on July 25th, 2021: “São Caetano is paradise for scavengers. That yellow bag is gold!”

#### 4.1.2 Luanda, capital city and province of Angola

Adequate urban solid waste management is one of the many challenges faced by rapidly growing cities, and Angola municipalities are no different. With the increase in waste generation, it is fundamental to implement efficient collection, sorting, recycling and final disposal systems. The lack of infrastructure and awareness about the importance of waste

management can result in environmental problems, such as soil and water contamination (PESTANA, 2011). Chart 4 below shows the population and waste generation of Luanda (capital city).

Chart 4 - Population data for municipalities of Luanda, Angola, and *per capita* and annual generation, in 2022.

Municipalities	Population (2022)	UW <i>per capita</i> generation in kg/inhabitant/day	Annual UW generation (tons)
Luanda (capital city)	1.742.180	1,2	752.622

Source: Data extracted from the MOBIZNO report, 2022.

According to the document entitled “The Urban Problem of Luanda: The Issue of Waste in the Angolan Capital”, the Luanda Cleaning and Sanitation Company (*Empresa de Limpeza e Saneamento de Luanda*, Elisal), which is responsible for urban solid waste collection, transportation and final disposal at some municipalities in the province of Luanda, recorded irregular and infrequent waste collection in Kilamba Kiaxi (a neighboring municipality of the capital Luanda). Of the 62 days of monitoring, only 16 days of effective collection were recorded, with times varying between 8:00 am and 10:00 pm. Associated with irregular collection times, low frequency contribute to waste accumulation, causing bad smells and attracting vectors such as rats and insects (PAULA; CHAVES; ALMEIDA, 2016). In March 2023, it was observed that this problem seems to persist in several locations of the municipalities neighboring Luanda (capital city).

When UW is deposited in open spaces without any treatment process, it contaminate the soil. After rainfall, it may even contaminate aquifers with pathogenic elements, negatively affecting aquatic life and, thus, constituting a soil and aquifer pollution problem, in some cases with presence of heavy metals such as mercury, cadmium, nickel and chromium, among others (CRUZ, 2005).

This situation becomes even more concerning when considering Angola's sanitation reality. A survey conducted in 2012 by the Center for Studies and Scientific Research at the Catholic University of Angola identified that 42% of the Angolan population had access to clean drinking water, and that 60% had access to improved basic sanitation facilities (CEIC-UCA, 2012).

According to QUIBB (2011), the proportion of the population with access to appropriate water and sanitation was only 15%. The main source of drinking water supply in urban areas was tanks supplied by water trucks (29%) and, in rural areas, rivers, streams or lakes (47.6%). On the other hand, more than half of the population (62.1%) drinks water without any type of treatment.

In this way, it was observed that improper UW disposal and the deficient water and sewage system contribute to fueling a vicious cycle of environmental contamination. This is because, with groundwater contamination, water treatments become more challenging and costly, consequently hindering access to clean drinking water. This is a situation that, in Angola, has led to an increase in the bottling of drinking water, an increase in its commercialization in PET bottles, and their improper disposal. In March 2023, the price of a 5-liter bottle of water varied around 550 kwanzas (USD 0.67), whereas the mean cost is BRL 10.00 (USD 2.05) in Brazil.



There are no records of door-to-door collection of urban waste (UW), whether dry (recyclables) or undifferentiated (rejects), in Luanda (province). According to the Strategic Plan for Urban Waste Management (PESGRU), in Luanda (province) waste was disposed in trash bins (small dumping spots) dispersed throughout the city. This situation changed with the opening of the Mulenvos landfill in mid-2007, which began to receive waste from neighboring municipalities. With 525 hectares and initially designed to last 23 years, it was found that it will last (or lasted) 15 years due to the increasing amount of UW that is discarded and sent to the landfill (ANGOLA, 2012).

UW generation in Angola is around 0.46 kg (inhabitant/day), whereas in the province of Luanda it is estimated that the weighted mean rate of *per capita* production is 0.65 kg/day and in the city of Luanda (capital), approximately 1.0 kg/day. According to the same document, total waste production reached nearly 3.5 million tons in 2012 (ANGOLA, 2012).

As observed in 2012, according to the study conducted by CEIC-UCA, due to irregular waste collection management, and during a visit to Luanda (capital city) in March 2023, it was noticed that the population continues to dispose of their waste in small trash bins (small dumping spots), ditches (rainwater drainage systems), or simply burn their waste in open areas, producing varying amounts of toxic substances such as gases, heavy metal particles, organic compounds, dioxins and furans released into the atmosphere (CEIC-UCA, 2012).

In a study carried out in the province of Huíla, municipality of Lubango, Angola, Almeida (2017) considered that the absence of efficient UW management, mainly with regular collection days and times, and adequate and well-defined locations, leads the population to not depositing waste in containers, even when they are less than 50 meters away from their houses.

Figure 1 below shows examples of outdoor disposal in rainwater drainage ditches. In the province of Luanda, storm drains or what are commonly referred to as “*bueiros*” or “*bocas de lobo*” in Brazil are called “*esgoto*” (sewer) by the local residents.

Figure 1 - Ditches with USW in the Samba region, a district of Luanda, capital city of Angola, 2023.



Source: Own collection.

Since September 2022, Elisal has been contracting cooperatives of scavengers to expand the waste collection geographical reach in Luanda (province). Currently, six cooperatives are operating as contractors, performing urban cleaning of roads in some municipalities from the province of Luanda and collecting recyclable materials. The existence of an Association of Young Recyclable Material Scavengers of Angola (*Associação de Jovens Catadores de Materiais Recicláveis de Angola*, AJOCAMARC) was also verified.

Collection of recyclable materials, predominantly Polyethylene Terephthalate (PET) bottles, is carried out by the cooperatives' employees and transported to their respective headquarters, where they are stored for subsequent sale to transformation companies. The price of a kilogram of PET bottles in March 2023 varied between 100 and 200 Kz/kg (approximately BRL 1.20/kg) (MOBIZNO, 2022). In Brazil, the price per kilogram varies between BRL 0.50 and BRL 2.00 when sold from scavengers to temporary storage facilities (scrap dealers) or directly to transformation companies.

Among the three cooperatives visited in Luanda, only one had a press and a scale. The others stored the bottles in large plastic bags, approximately 500 liters in size, where manual pressing (one by one) of PET bottles was observed with the aim of optimizing the volume per bag. In all cooperatives, this process takes place without using any type of Personal Protective Equipment (PPE) or ergonomic conditions.

According to diverse information gathered in the field, the cooperative members earn a fixed monthly salary of around 2 minimum wages (64,000 Kz), but without any share in the results obtained from the materials collected, which end up being used by the administration to cover the cooperative's expenses, going against one of the principles of cooperatives in Brazil, which is economic participation of members (SEBRAE, 2013), and hinders the incentive to achieve more significant results in recyclable materials.

In the 7 districts of Luanda (capital city), according to a survey conducted by Mobizno (2022) with 218 scavengers and 18 intermediaries, a total of 4,949.5 kilograms per day were collected. This results in an annual projection of 14,254.56 tons of recyclable materials, as shown in Chart 5 below.

Chart 5 - Number of scavengers and recycled materials by district of the capital Luanda, in 2022.

Municipality	Districts	Total of scavengers	Total of intermediaries	Collected recyclables per year (tons)
Luanda (capital)	Ngola Kiluanje	6	-	31,392
	Samba	82	-	124,704
	Ingombola	69	5	119,232
	Rangel	20	5	383,760
	Neves Bendinha	4	-	42,912
	Maianga	20	5	670,176
	Sambizanga	17	3	53,280
	Total	218	18	14,254.56

Source: Adapted from MOBIZNO, 2022.

According to data obtained in the survey conducted by Mobizno (MOBIZNO, 2022), when we relate the annual generation of urban waste in the capital Luanda to the collection of recyclable materials (annual projection), we have 1.89% of recyclables collected in relation to the total waste generation. As shown in Chart 6 below.

Chart 6 - Relationship between generation and collection of recyclable materials in Luanda, 2022.

Municipality	UW generation (tons/year)	Recyclables (tons/year)	%
Luanda	752,622	14,254.56	1.89%

Source: The authors, based on MOBIZNO (2022) data.

#### 4.2 Relationship between USW generation and collection in São Caetano do Sul, Brazil, and Luanda, Angola.

Waste generation and collection are two different phases in the solid waste management cycle. Both play fundamental roles in minimizing environmental impacts and promoting sustainability.

Waste generation refers to the production of recyclable waste (dry), organic waste (wet) or rejects (undifferentiated), originating from domestic, commercial, industrial, construction, health services, and other activities. Urban solid waste is generated in all stages of daily life and human activities. Collection is the process of gathering, transporting and removing the generated waste to a location where it will be treated, processed or prepared, and it can even be disposed of in sanitary landfills, controlled landfills, open dumps, or sent for recycling or composting. Collection is a crucial stage to prevent the accumulation of untreated waste or even recyclable waste (IPEA, 2020).

Therefore, the relationship between the words “generation” and “collection” in waste management and disposal issues can lead to misinterpretations because collecting does not necessarily mean that the waste was properly disposed of through recycling or sent to a sanitary landfill when needed.

São Caetano do Sul, SP, Brazil, declares that it collects 100% of what is generated. In the province of Luanda, Angola, according to data from INE (2014), as represented in Chart 7, it is identified that 41.6% of the households deposit their urban waste in containers, which will later be disposed of in sanitary landfills, whereas 58.4% is deposited in places that are either unlikely to be collected (open-air and buried) or indeed not collected due to having been burned

Chart 7 - Locations declared by families for UW disposal in the province of Luanda, Angola, 2014.

Total of household aggregates	Contentor (Container)	Open-air	Burning	Burying	Others	Not declared
1,484,450	617,985	806,372	18,654	19,566	16,853	4,920

Source: Prepared by the author with data extracted from INE (2014).

Due to the high percentage of improper disposal (open-air, burning, burying), it becomes difficult to determine the *per capita* recycling rate in Luanda, both in the province and in the capital city. This is because it was observed in the field that the contracted cooperatives prioritize cleaning roads and pedestrian areas indiscriminately, without distinguishing or separating the waste that could be destined for recycling.

This research revealed that, although São Caetano do Sul, SP, Brazil, and Luanda, capital city of Angola, differ in terms of some sociodemographic and geographical indicators and data, they face certain similar issues, albeit on different scales, in urban solid waste management and disposal, as shown in Figure 2 below.

Figure 2 - São Caetano do Sul, SP, Brazil (on the left), and Luanda, capital city of Angola (on the right): two locations with similar challenges in urban solid waste management and disposal, 2023.



Source: Author's collection

## 5 CONCLUSION

The conclusions of this paper begin by drawing the attention to one of the most important stages in the waste management and disposal process, both in Brazil and in Angola, which is the exclusion phase. In their book called “*Dirt: The filthy reality of everyday life*”, Rosie Cox et al. describe that, throughout human history, starting from the Neolithic period, people have developed tools and technologies to keep dirt away, creating ideologies that added the notion of danger to instill fear, coerce and educate individuals (COX et al., 2011). In the book called “*Homo Deus*”, Yuval Noah Harari describes how, since the 19th century, countries like France, Germany and Japan drained swamps, exterminated mosquitoes and built sewage systems to make their nations healthier and stronger, preparing them for war.

It is thus concluded that exclusion, this age-old stage in waste management, as well as its periodicity and frequency, is critical for the implementation of public policies.

In São Caetano do Sul, the segregation (separation) of waste types takes place before exclusion, with clear criteria for the population regarding the specific days and times for disposing each type of waste. However, adherence to proper disposal is relatively low. Lack of knowledge about the waste destinations after disposal, the medium- and long-term environmental impacts and damages, and the absence of public policies promoting environmental education and the 3Rs (Reduce, Reuse and Recycle) culture are some of the aspects that contribute to a significant percentage of the population not prioritizing or being unconcerned about waste-related issues and their impacts.

In the case of the municipalities visited in the province of Luanda, it was observed that waste disposal occurs without any form of segregation. The priority is to move away from waste, whether disposing of it outdoors, in ditches, in trash bins (dumping spots where waste accumulates), burying, burning or in containers that are eventually found along the way. Thus, recyclable waste is segregated by those responsible for disposal (exclusion), after it has been deposited indiscriminately, which leads to its devaluation due to being mixed with sand, soil or other contaminants.

It is also worth noting that, in general, obtaining data on urban solid waste management and disposal is a sensitive subject matter, as it can expose potential weaknesses and deficiencies in administrative management. Much of the information included in this

research was obtained through surveys and analyses based on the examination of administrative processes, academic papers and sources from local governments.

It is concluded that the recycling rates are low. Two very different realities with very similar recycling indicators. The absence of public policies capable of promoting responsible consumption is accompanied by the lack of urban planning to encourage proper waste disposal by consumers. In both cases under study, it became evident that there is a demand for strategies to value USW and mechanisms that promote post-consumer selective disposal, in order to benefit the reintegration of waste into the production chain.

We hope that this research can contribute to reflections on the topic, especially regarding the role of each social actor, as well as to public policies related to proper urban solid waste management and disposal.

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