WASTE MANAGEMENT OF GLASS CONTAINERS: a case study in a bohemian neighborhood at the city of São Paulo.

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Project   Waste Research in Europe / Portugal View project

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Abstrac (1462)

The agenda of sustainability, environmental and waste management has slowly gain importance in the decision making process of Brazilian organizations. The pressure from different ends like society, consumers, media, NGO's, and especially by the government begins to take effect in some sectors. However, when observing some areas related to the food sector, as bars and pubs, it seems that their managers still do not follow this trend. The objective of this study is to understand, through directed interviews, how these managers behave toward the disposal of glass waste containers, such as cullets, of beverages traded by them, where the main interest is to identify and analyze the impacts of the National Waste Solid Police, approved in 2010 by the Brazilian Government. A well-known bohemian neighborhood in São Paulo, with a high flow of customers and clients in the city nights and, consequently, a high amount of glass containers disposed was chosen to be the basis of this study. The first part presents the literature review, focused on the development of environmental legislation in Brazil, highlighting the Law 12.305/2010. Subsequently, a contextualization of the case study of micro and small companies in the bars sector is made. Additionally, the relevance of glass and recycling data is pointed, followed by the interviews results and

discussion. The last part shows the final considerations, which emphasizes legal enforcement in this sector is not yet perceived and explores new possibilities.

Key words: Solid Waste, Legislation, Glass, Recycling, Micro and Small Companies, Pubs

1. Introduction (32.602)

With the centralization and growth of population in urban centers, along with a rapid increase in the consumption of goods and their disposal, among other factors, a new problem has raised and needs to be constantly addressed: high waste generation (Medina 2011, Zaman and Lehmann 2013). There are several impacts associated with this problem; since solid waste is considered a high source of health, environmental, economic, political and aesthetic problems. The enormous volume of waste generated by modern society and arranged in inappropriate places contributes to the contamination of the soil, air and water; the proliferation of diseases; the clogging of sewer networks; environmental degradation and even estate depreciation. Moreover, the increase in solid waste generation has other negative consequences: increasingly high costs of its collections and treatments, more difficulty to find areas available for its final disposal and a bigger waste of raw material (Fernie and Hart 2001, Bautista and Pereira 2005, Henry, Yongsheng and Jun 2006, MacRae 2012).

Many discussions have been promoted worldwide by various entities in the last forty years, forcing governments and the society to emphasize the approximation of the environmental issue with political and economic factors. The environmental issue finally acquires a significant importance, having, as one of its most important aspects, the level of involvement of various social spheres, including business owners and managers to incorporate differentiated environmental practices, leading to less environmental impact (WCDE 1987, Lélé 1991, Grossman and Krueger 1995).

Government actions in various parts of the world had intended to contribute to the creation of specific legislation to combat negative impacts or promote actions toward the environment. Governments have adopted measures through public policies, regarding the establishment of laws, guidelines and standards; instruments that directly and indirectly affect environmental issues. In Brazil the first laws concerning industrial pollution emerged in the 1970s, based on the command and control approach. The next decade, the institutionalization and regulation of environmental issues took place, along

with the consolidation of the environmental management concept by the advent of legal instruments in addition to a mandatory Environmental Impact Assessment for some activities (Barbieri 2007).

Due to the increase of social and legal pressures over the market dynamics in recent years, never before organizations had to emphasize their management practices so much, especially regarding the environmental management of their waste as a direct result of their business. Therefore, this article explores, empirically, how some pubs' and bars' managers comprehend the impacts of the National Solid Waste Policy, adopted in 2010 in Brazil, on the way they manage their activities related to the disposal of glass bottles sold in their establishments.

2. Background

There can be found, in the literature, several studies which identify the various factors that motivate organizations to practice actions aimed at environmental issues. There are many contributions to the evolution of environmental management such as market and society pressures, legal regulation, high costs of compliance, and others (Hart 1995, Russo and Fouts 1997, Sharma and Vredenburg 1998, Khanna and Anton 2002, Delmas and Toffel 2004, Bréchet and Jouvet 2009). Some studies have shown that companies are acting responsively (Bansal and Roth 2000, Porter and Kramer 2006), others have investigated the internal and external factors that push businesses to adopt environmental actions- very often at first on a reactive basis, and as its management level reachs higher stages, to a proactive posture (Henriques and Sadorsky 1996, Finch 2005). Another interesting study has evaluated voluntary self-regulation initiatives (Christensen and Nielsen 1996, Delmas and Toffel 2008). Furthermore, there are studies sought to understand how companies faced the pressure for changes in their management conductions, fitting them whether as threats or opportunities to business (Winn and Angell 2000, King 2000, Brio and Junqueira 2003, Clemens, Bamford and Douglas 2008). Some opportunities, particularly those related to reuse and recycling, are pointed out: the reduction of materials and raw materials consumption, energy saving, cost reduction, competitive advantage, an improved image, a better acceptance of products by the market, reduction or elimination of fines and penalties, among others (Kumar and Malegeant, 2006). However, studies are still needed to conclude whether

there is, indeed, an economic and also environmental benefit to all sectors, since not always the results are compensatory (Beullens, 2004).

2.1 Legislation

The debate to properly manage and seeking reduction on the generation of waste began to be addressed in several countries in the late 1980s. Some movements via legislation emerged in the 1990s. A strong emphasis was directed on packaging waste: in Switzerland in 1990, Germany in 1991, France and Austria in 1992, Sweden in 1994, Italy in 1996; Belgium, UK, Portugal and Spain in 1997 (Fernie and Hart 2001). The European Parliament and Council Directive established, in 1994, the rules relating to the subject, thus allowing the minimum standards to be followed by the countries of the European community. In the United States, federal legislation introduced its guidelines through the Pollution Prevention Act in 1990 (Marsh and Bugusu 2007). Canada released the Environmental Protection Act in 1999. In Japan, the law of waste management passed in 1970 and the one addressed packaging in 1995 (Tsukada 2013). In Brazil, the National Solid Waste Policy was established in August 2010, after having waited twenty years to be voted by the legal spheres, due to a strong lobbying by various economic sectors that did not want the law to be approved.

The main interest of this article lies in reflexes arising from the legal aspects of the correct waste management regulations in organizations. It was noted that many scholars have researched specific sectors such as packaging, electronic goods waste, tourism, among others, having as object the assessment of impacts of legislation on their markets (Fernie and Hart 2001, Freire, Thore and Ferrão 2001, Ometto, Guelere Filho and Souza 2006, Magrinho, Didelet and Semião 2006, González-Torreand and Adenso-Díaz 2006, Taseli 2007, Sharma, Ammons and Hartman 2007, Kumar and Putman 2008). Studies indicate no alignment of managers' perceptions regarding environmental legal regulations, which sometimes represent threats or opportunities, as well as divergent results on the influences of the stages of evolution of their management (Sharma and Nguan 1999, Rugman and Verbeke 2000, Clemens, Bamford and Douglas, 2008, Porter and Kramer 2011).

Nevertheless, the understanding of how managers consider regulatory environmental factors in relation to their organizations is an important contributor in the interpretation

of managerial attitudes of organizational behavior (López-Gamaro, Molina-Azorín and Claver-Córtes 2010).

2.1.1 Brazilan Law

Brazil is considered a country with no major legal traditions. Even in the colonial period, measures were taken to try to contain health problems resulting from increased trade and economic activities of import and export. On a research on environmental policy, it was verified the presence of concerns related to nature and the environment since the first decades of the 1800s (Bernardo 2006). However, a long time has taken place until more extensive and generalized responses were deferred. In 1934 various rules and regulations were instituted. Even so, the inclusion of the environment on the political agenda by the government occurred only in the 1960s, mainly by the impacts of industrial expansion and the intensification of contaminants generation of and the depletion of natural resources. At the end of the 1970s, municipal solid waste was attached in public policy, in the sanitation sector, by the creation, in 1973, of the Special Secretariat for the Environment, which was a milestone for the country, since the explicit political incorporation of environmental issues. However, the lack of investment, allied to the diversity and complexity of the waste system did not help to provide greater advances in this area. The Brazilian model of growth, based on rapid and concentrated industrialization, led to worsening urban issues, in particular the increase of industrial pollution and water supply, affecting populations of major cities (Gutberlet 2000).

The Brazilian environmental policy then proceeded to contemplate different programs and projects with the creation of specific entities. The establishment of the National Environmental Policy through the Law 6.938 in 1981 was another important milestone for the country, but still, it did not yet presented an efficient and specific regulation. Even with the creation of several environment-related laws, the issue of solid waste was not clear, and this hampered its management.

The Federal Constitution, enacted in 1988, has a specific article on the environmental issue, ensuring everyone the right to use the nature, as long as each one preserves it for future generations (Art 225, CONSTITUIÇÃO FEDERAL 1988).

A new environmental drive to the country was due to the resolution of the National Environment Council (CONAMA 313) in 2002. It represented the beginning of a

regulatory process and a more specific control of the waste generated by industries with national activity, including the environmental licensing process. From 2004, the need to classify each type of waste arose in order to allow a better regulation (ABNT NBR 10.004).

2.1.2 National Solid Waste Policy

The National Solid Waste Policy (NSWP), established in August 2010, is part of the National Environment Policy (NEP), and now includes the regulatory framework on waste management in Brazil. Meanwhile, it demanded a lot of changes and new conformations in the systems adopted by business, consumers and the society in general.

The Law 12.305/2010 established the NSWP. It states that are subject to law enforcement: individuals or legal persons, public or private organizations, are responsible, directly or indirectly, by the generation of solid waste, therefore should develop initiatives to integrate and management them. Radioactive wastes are excluded, because they are ruled by a specific law. The law spells out relevant definitions to integrated solid waste management, reverse logistics, environmentally appropriate disposal, reuse, solid waste, shared responsibility for the life cycle of products, among others. There are several relevant principles, including the principles of prevention and precaution and the polluter-pays goals, sustainable development and eco-efficiency. It also addresses the objectives of the law in which we highlight the strong focus on reducing impacts to the environment and therefore to the society, thus demanding new social and economic behavior: protection of public health and environmental quality, not generation, reducing, reusing, recycling and solid waste treatment and environmentally sound disposal of waste; encouraging the adoption of sustainable production and consumption of goods and services; adoption, development and improvement of clean technologies in order to minimize environmental impacts; reducing the volume of hazardous waste, encouraging the recycling industry; aimed at promoting the use of raw materials and inputs derived from recycled and recyclable materials; integrated management solid waste.

Still features the participation of all governmental levels through its direct investments in acquisitions and signings that should prioritize recycled and recyclable products, goods, and services that are consistent with patterns of social consumption and

environmentally sustainable integration of scavengers and recyclable materials in actions that involve shared responsibility for product life cycle; encourage the implementation of the assessment of the life cycle of the product; encourage the development of environmental and business management focused on improving production processes and systems to reuse solid waste, including energy recovery.

Among the various instruments established by the law, there can also be found solid waste plans, inventories and also an annual declaratory system of solid waste. The order of priority for the guidelines applicable to solid waste management is as the following: no generation, reduction, reuse, recycling, treatment of solid waste and environmentally adequate disposal of waste.

It also defines the government, as well as the business sector and the community as responsible for the effectiveness of actions to ensure provisions, guidelines and compliance with the NSWP as set forth in Law.

It should be noted as a difference between this law and others existing in the world, the fact that the responsibility is shared, i.e. it covers individually and into sequenced manner importers, manufacturers, distributors and traders, consumers and holders of public services and urban solid waste management cleaning. This law differs from other laws, such as the European directives, where the onus is on the manufacturer. This, on the one hand, shows larger amplitude; on the other hand, can hinder the effective applicability as many stakeholders are involved.

Pointing more specifically towards organizations, the primary motivating factors of NSWP are guided to not harm public health and the environment, to search how to turn socioeconomic problems into opportunities, the problem of high levels of production and consumption, and, especially, the shared responsibilities of the whole chain. Through the NSWP it was established the obligation of entrepreneurs to make a choice among reduction, reuse and recycling of waste, thus recognizing their economic value.

2.2 Micro and Small Companies

From the point of view of legislation adopted in Brazil, all legal efforts recognize the necessity of public space to be preserved. Natural resources, such as raw materials used in large-scale industrial production, belong to each and every individual. Preserve them

is to fight for the most basic rights of every being and no private interests, whether it is a small or a large company, may be above that.

Based on the literature of environmental management and waste generation, we have seen the need for a better understanding regarding the adoption of new business practices that address the legal framework. Analyzing the service sector, more specifically bars, in a region of great activity in this branch of business, having as its main interest to verify the existing practices and or the needs for changes in the management processes of these institutions to adjust to the law system, seems to be a relevant contribution to the research of Business Administration.

In Brazil, the sizes' classification of companies is done by means of total revenues (Complementary Law 123/2006) but can also be framed by the number of employees in the trade and service sectors: up to 9 employees, it is considered a Microenterprise, and from 10 to 49 employees, as a Small Company (SEBRAE, 2013). This work aims to identify the impact of the legal application of such laws in Micro and Small Companies (MSCs), since these concerns already reach large companies, and, over time, it will also impact the survival of smaller companies. MSCs play an extremely important role in the Brazilian socio-economic dynamics, since they respond for 25% of the GDP, and also account for 52% of the active labor force in the country, which is equal to 40% of total payroll (SEBRAE, 2013). This study analyses the conduct of micro and small-sized organizations in the food sector, related to their waste management of glass bottles in bars of a bohemian neighborhood of São Paulo.

3. Research methodology and Results

This is a qualitative study, using a case study methodology (Baxter and Jack2008) performed through directed interviews (Gephart Jr. 2004) with managers of micro and small size pubs in a region of great liquor sales in the city of São Paulo. Having as its primary objective to understand how the disposal of glass packaging is made and identify the possible impacts of the NSWP into these businesses.

Since this is a fairly recent topic in the country, it was decided to develop an interpretive qualitative study, in which we have opted to discuss this process from the perspective of some of the main actors involved. Based on a literature review on environmental management, waste management and all relevant legislation, an interview script containing 13 open-ended questions was prepared. This script was originally used in a pilot test to verify its applicability and intelligibility of the questions. After its validation

in a pub that has a different view of their activities in relation to environmental impacts, the research was then conducted with eight bars in the area chosen for the study.

This is an exploratory research in nature. Due to this fact, it was necessary to carry out interviews with several managers and owners who were responsible for implementing regulations which may impact their business. In order to give an in-depth insight into the issues involved, a case study of one the highly concentrated area of pubs and restaurants in the city was chosen. It is important to notice that these interviews were merely undertaken to gain information and insights, which were not readily accessible otherwise.

The main points covered in the interviews were: Sustainability, Environmental Management and Waste. For each of these central themes, keywords were selected and then analyzed according to the intensity of each in the content of the interviews (Clarkson et al 2008). Words such as legislation, fines and supervision were related to Environmental Management. For the theme of Sustainability some of the keywords were environment, nature and conservation. Concerning the Waste topic words like reuse, recycling, pollution and reverse logistics were listed. A total of 37 words (14 to Sustainability, 10 to Environmental Management, and 10 for Waste) were analyzed. As a complementary analysis, we checked the level of relevance of those keywords by the perception of managers interviewed in order to identify how representative each topic means for each respondent.

3.1 Case Study

The city of Sao Paulo has approximately 12 million inhabitants (IBGE 2013), and generates about 18.000 tons of municipal solid waste (MSW) daily. Of this total, 13.000 tons are allocated to controlled landfills, only 1.8% belongs to the selective collection and the rest is discarded improperly (Prefeitura de SP 2013). MSW include both those generated by household as well as the waste generated in commercial activities. In the composition of MSW, glass represents 1.4% of its total (LIMPURB 2008) and there is an estimated consumption of glass containers in the order of 5.5 kg per inhabitant (IPEA 2012). Commercial wastes (CW) are originated by many sources, such as supermarkets, banking facilities, shops, bars, restaurants. CW is composed by paper, plastic, various containers (aluminum, glass, Styrofoam, foam) as well as paper towels, toilet paper and organic materials. The City Council is co-responsible for collecting small amounts of it

(usually less than 50 kg or 100 liters), according to specific local legislation (Lei 13.478/2002).

3.1.1 The Glass

The formulation of the glass comes from sand, limestone, soda ash and feldspar and is durable, inert and has a high rate of reuse in homes material. In addition, the material is easily recycled and may be returned to the factory, back to the production of new packaging, replacing completely the virgin product - once the glass can be melted numerous times without losing its qualities or properties. Glass is a product that can be recycled 100% (Colombo et al 2003) and indefinitely (González-Torreand and Adenso-Díaz 2006).

There are many possibilities for the use of post-consumed glass: it may be reused or recycled into packaging, or in the composition of asphalt and paving roads, construction of drainage systems, flood contention, or also on energy recovery (Freire, Thore and Ferrão 2001, González-Torreand and Adenso-Díaz 2006, Cempre 2013).

The inclusion of broken glass and cullets in the normal process of making glass adds numerous ecological benefits, such as: the reduction on energy and water spending, which ensures lower CO_2 emissions, contributing to climate and environment protection. For every 10% of glass cullet used in the production, there is a 4% save of the energy needed to carry out the melting in the industrial ovens- since the temperature for melting the recycled glass is considerably lower, and the reduction of 9,5 % in water consumption (Ferver 2013, CEMPRE 2013).

In Brazil, the glass is used in Packaging, Cutlery, Glass and Glazing Technical Plans. Only concerning packages, there was a production of 1.293 tons in 2008 (ABRELPE 2012). The largest consumer markets of glass packaging in Brazil are: Drinks, Food and Drugs, being the largest users the beverages packages (Beer, Brandy, Wine, Rum, Whiskey, Cider) (Brazil Pack Trends 2012). It is estimated that, for those 1.293 tons in 2008, 47% were recycled (27% one-way packaging and 20% returnable packaging) and over 33% have been reused (9% for household reuse, and more 24% for improper reuse). The remaining 20% of the glass used in post-consumer containers have been disposed in sanitary landfills or manner ignored (ABRELPE 2012). Of the total recycled packaging, 40% is coming from the bottling industry, 40% of the diffuse market, 10% foreseeing of bars, restaurants and hotels, and the remaining 10% from the scrap of

industries. Just for comparison, in Germany, for example, the rate of recycling of glass packaging in 2011 was slightly more than 87%, corresponding to 2.6 million tons. In Switzerland the rate was 95% (Brasil Pack Trends 2012, CEMPRE 2013). These data show that there is a huge potential to be worked in Brazil.

To produce new glass products, none, or very little, raw materials need to be harvested from nature. This is a huge advantage (Ferver 2013). Currently, almost no glass packaging is made exclusively from raw materials. The usage of the hulls of packaging recycled glass instead of raw materials is continuously growing. A new green glass bottle, for instance, can be made from 90% of recycled glass characteristics without losing any of its shape, color or quality. The white or colorless glass packaging contains about 50% recycled glass (Fever 2013). Additionally, the glass industry has been developing new techniques that seek to reduce the weight of their products in order to reduce the consumption of raw materials for the manufacture of bottles, and even being lighter, they have the same resistance (CEMPRE 2013).

3.1.2 The Pubs

Vila Madalena is an upper middle class neighborhood of the Pinheiros district in the western part of the city of São Paulo. The neighborhood is known for its bustling nightlife and its history as a center of São Paulo bohemian culture and art. The neighborhood is filled with dozens of art galleries and studios, an eclectic mix of restaurants and bars. Also, it is one of the most attractive areas for residents and visitors. It has 45 bars, all being micro or small companies (MundoVila 2013).

Eight bars were randomly chosen and interviewed. In Brazil, there is great difficulty in getting owners or managers that agree to participate, even though the answers are treated anonymously and confidentially. This stems from distrust of managers of MSE's, since they are little or nothing familiar with field research and, most importantly, they feel somehow threatened because they believe that their practices could be passed on to competitors or, that their responses could compromise them in case of any noncompliance of the standards required.

3.2 Results

The information extracted from the interviews was rich and interesting, as well as the analysis of primary data provided some amazing understandings.

Respondents showed that their concerns with the glass containers are more related to preventing accidents at the time of disposal, rather than making a correct treatment of this waste. This is because the packages may break and cause injury to their employees, which would result in an impact to the business by a temporary absence from work as well the possibility of labor suits. According to the interviewees, there is no distinction between garbage and waste. In 100% of the interviews, the managers do not see any value in waste generated, they did not even consider the possible impacts caused by them to the environment and do not see how the differential treatment by reuse or recycling through reverse logistics practice can be linked to their business sustainability. The word garbage was the most cited (44 citations in 53 times).

Legislation and inspection issues were a lot discussed in the interviews. We note that despite the existence of legislation that rules the situation of solid waste in the country and municipal laws, the supervision is still inefficient. From the perception picked up in the interviews, it simply does not happen in the neighborhood. Interviewee 6 stated: "Here in the neighborhood we have inspections for everything. Lots of inspection, but nothing regarding garbage. It's always about hygiene, smoking and noise. There is no Waste Disposal inspection". Additionally, Interviewee 4 said: "The inspection of waste disposal is completely disregarded. I never knew that a place was fined because of garbage. There is enforcement here in Vila Madalena for everything but rubbish". According to the interviewees, there is a strong inspection over laws concerning noise and cigarette, but nothing is done about the proper disposal of wastes and their management.

Another important thing to be highlighted was the discontent of respondents regarding information and guidance concerning laws and their effectiveness. For Interviewee 5 "It is difficult to implement sustainable practices for reasons of education. There is a lack of guidance and supervision. The government must advise, help with planning and then monitor". The Interviewee 6 said "I believe there is a lack of information for the people", and Interviewee 8 said "I think you should have a government aid because this is a complicated operation. The State sends the fiscal to fine the establishments and does not perform any type of work orientation in order to indicate how such problems can be solved and how these issues should be treated".

It also brings attention to the low level of involvement by the establishments in incorporating environmental management practices in their business. It was evidenced

by the interviews that reducing environmental impacts and incorporating waste management practices would only become relevant when the penalties were a constant routine into the business. Interviewee 1 stated that "In our business it has not become a problem yet. To become a priority, it must be a problem. I do have a problem regarding cigarettes, my place can be fined. So, I take care of this".

For all respondents the themes regarding waste are irrelevant, none of them appeared to care or to know about the final destination of the waste generated by them. They do not even concern about the reduction of waste generation. Example of this was the statement of the Interviewee 4: 'We have a contracted company that collects our garbage. We separated and they collect everything. But what they do then with the trash, I do not know". The Interviewee 5 noted "The trash stays in the cold camera. At night we put it out. An outsourced company comes and takes out the trash, what do they do with the trash? I have no idea".

By the examples and observations presented in this paper we can assume that despite being a motivating factor for the environmental management practices, the recently solid waste law approved in Brazil, has not yet been fully incorporated into the organizations. The study provides important information concerning waste management in MSC at the food sector. In our sample group, managers had good knowledge about the need for waste separation and recycling, however, they do not clearly know their responsibilities into the larger cycle of post-consumer chain. Because they do not have any specific motivation, managers just did not apply this in their business. Furthermore, none of the managers knew what is done with their waste once collected. It seems, according to our interviews, that a change in the management practices of the pubs analyzed would happen if there were a more strict inspection by the State, or a larger demand by customers.

4. Final Considerations and Further Studies

Although this research has typical limitations of qualitative studies such as subjectivity, no possibility to extrapolate results, and also the unfamiliarity of companies in the Brazilian market to participate in field research, unlike other markets such as U.S. and Europe, for example - which gave us less access to a bigger sample, we understand that the NSWP is a huge legal milestone for environmental management in Brazil. This law presents the differential of having established the shared responsibility of all

stakeholders in the supply chain (importers, suppliers, manufacturers, distributors, marketers, public sector, consumers) concerning waste management and its impacts.

Nevertheless, we found that much remains to be done to the effective legal implementation of such law, since the interviewed establishments do not feel they are part of the problem in the generation and management of waste. The requirement of the law will only be perceived, according to the managers interviewed, when penalties actually start affecting their businesses, or a higher demand by customers impose new attitudes. One possibility arose by this research lies in the imposition by the chain itself, i.e., when manufacturers and distributors of beverages, such as AmBev or Femsa (large companies), for example, knowing they will be charged and penalized for non-compliance of reverse logistics, or not reaching the minimum level set for waste management, they can exercise a greater pressure on traders and pubs to participate more actively in the process.

The managers of the analyzed bars sort and separate waste, among other types of packaging, such as glass, paper, aluminum and plastic, but do not do their inventory; neither manage their waste nor know about the destination of their waste once it leaves their facilities. There is null perception of responsibility to the impacts caused by their businesses. Because of that, there is still a long way to be perceived by society until the environment can finally start to feel the actual impact of the law passed in 2010. Both managers and the Brazilian society as a whole seem to not know the great importance and responsibility regarding proper waste management.

If the city of São Paulo, which is one of the major urban centers of the world, and also a pioneer in social, economic, political and cultural activities of the country, in a neighborhood known as very active in social and cultural life, has not yet awakened to new business practices from the Law 12305/2010, it is thought that the other locations, not only in the state of São Paulo but also the around the country, are in even less advanced situations. As a proposal for further studies, it would be interesting to explore the impact of the law against other wastes such as aluminum (which has high value in Brazil and 99% of aluminum cans are recycled), pet bottles, or other packages, and seek other locations beyond the city of São Paulo. Additionally, it may be emphasized the tracking along the entire chain of glass from the manufacturing to the final disposal. Or, it may analyze larger sized organizations to contemplate whether the law is already effective in their business.

As Barr (2005) pointed, it is widely acknowledged that although legal and economic instruments can have some impact on the waste process, the decisions that the hole society (including individuals, managers, organizations) make about what to buy, how to use, and how to dispose of products have fundamental importance if the waste problem is to be tackled effectively.

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